Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

# User's Manual

# *WindoWall™ System*

## *MGP 464W, MGP 464W DI*

### WindoWall Processors

68-1481-01 **Rev. B**
06 08

# Precautions

## Safety Instructions • English

**This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.**

**This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.**

### Caution

**Read Instructions** • Read and understand all safety and operating instructions before using the equipment.

**Retain Instructions** • The safety instructions should be kept for future reference.

**Follow Warnings** • Follow all warnings and instructions marked on the equipment or in the user information.

**Avoid Attachments** • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

### Warning

**Power sources** • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

**Power disconnection** • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

**Power cord protection** • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

**Servicing** • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

**Slots and openings** • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

**Lithium battery** • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

## Consignes de Sécurité • Français

**Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).**

**Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.**

### Attention

**Lire les instructions**• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

**Conserver les instructions**• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

**Respecter les avertissements** • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

**Eviter les pièces de fixation** • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

### Avertissement

**Alimentations**• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

**Déconnexion de l'alimentation**• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

**Protection du cordon d'alimentation** • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

**Réparation-maintenance** • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

**Fentes et orifices** • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

**Lithium Batterie** • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

## Sicherheitsanleitungen • Deutsch

**Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.**

**Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.**

### Achtung

**Lesen der Anleitungen** • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

**Aufbewahren der Anleitungen** • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

**Befolgen der Warnhinweise** • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

**Keine Zusatzgeräte** • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

### Vorsicht

**Stromquellen** • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

**Stromunterbrechung** • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

**Schutz des Netzkabels** • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

**Wartung** • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

**Schlitze und Öffnungen** • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

**Litium-Batterie** • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

## Instrucciones de seguridad • Español

**Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.**

**Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.**

### Precaucion

**Leer las instrucciones** • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

**Conservar las instrucciones** • Conservar las instrucciones de seguridad para futura consulta.

**Obedecer las advertencias** • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

**Evitar el uso de accesorios** • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

### Advertencia

**Alimentación eléctrica** • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

**Desconexión de alimentación eléctrica** • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

**Protección del cables de alimentación** • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

**Reparaciones/mantenimiento** • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

**Ranuras y aberturas** • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

**Batería de litio** • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

## 安全须知 • 中文

**这个符号提示用户该设备用户手册中有重要的操作和维护说明。**

**这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。**

### 注意

**阅读说明书** • 用户使用该设备前必须阅读并理解所有安全和使用说明。

**保存说明书** • 用户应保存安全说明书以备将来使用。

**遵守警告** • 用户应遵守产品和用户指南上的所有安全和操作说明。

**避免追加** • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

### 警告

**电源** • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过 。

**拔掉电源** • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

**电源线保护** • 妥善布线， 避免被踩踏，或重物挤压。

**维护** • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

**通风孔** • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

**锂电池** • 不正确的更换电池会有爆炸的危险。必须使用与厂家推荐的相同或相近型号的电池。按照生产厂的建议处理废弃电池。

## 声明

所使用电源为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

### FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

**NOTE** *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

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# Chapter One

# Introduction

About This Manual

About the MGP 464W WindoWall Processor

Features

Application Diagram

# Introduction

## About this Manual

This manual discusses how to install, configure, and operate the Extron MGP 464W WindoWall processor.

Throughout this manual, the terms "MGP 464W," "MGP," and "processor" are used interchangeably to refer to the same products, both standard and DVI versions.

## About the MGP 464W WindoWall Processor

The MGP 464W and MGP 464W DI are four-window RGB and video signal processors designed for WindoWall video wall systems. Each MGP 464W can display up to four video sources on a single screen in picture-in-picture or picture-by-picture format. The MGP accepts RGB, HDTV, component, S-video, and composite video signals on four fully-configurable inputs and has one scaled output. The MGP processor provides switching among inputs and has picture controls and presets, accessible via the WindoWall™ Console software.

The MGP 464W DI is an MGP 464W with a DVI input card installed, providing four DVI input connectors.

WindoWall uses a distributed video processing architecture that dedicates a separate MGP 464W WindoWall processor to each output device (projector, video cube, or flat panel monitor) in the video wall system. Each of the MGP's windows can show video, HDTV, or high resolution computer video content. The MGP 464W is compatible with most available display devices and outputs video at resolutions up to 1600x1200 and HDTV 1080p. Because a discrete, real-time processor is dedicated to each display unit in the video wall, the WindoWall system is fully scalable, supporting display layouts from 1x2 to 3x2 and larger.

WindoWall systems are available in sets of two or three processors, for 1x2 or 3x2 arrays, with or without DVI.

## Features

Each MGP 464W WindoWall Processor features the following:

**Scalable video wall multi-display support** — Enables scalable video wall systems from 1x2 to 3x2 and larger, on two or more displays.

**Four windows** — Up to four independent windows can be shown on a single display simultaneously, allowing up to four video, HDTV, and high-resolution computer video sources to be viewed at once on each MGP.

**Inputs** — The MGP 464W has four fully configurable video inputs, which accept RGB, HDTV, component, S-video, and composite video signals. The MGP 464W DI has four DVI inputs in addition.

**DVI background input** — A DVI input is provided on both models as a means to display live high resolution computer or HDTV video from a DVI source as a background to any presentation.

**Output** — The MGP 464W has one scaled output, available on a set of five BNC connectors for RGB or component video, and a DVI-I connector for digital video. The MGP 464W simultaneously outputs RGB computer video or HDTV component video signals as analog and digital DVI. 48 selectable output rates are available.

**RGB and video scaling —** All sources are scaled to a single output rate.

**Graphical user interface** — The WindoWall Console application software is the user interface for the WindoWall video wall system. It brings all of the MGP 464W processors together via TCP/IP and provides the tools and features to set up, create, and manage video wall presentations with up to four windows per display or video cube unit. See chapter 3, "Software-based Configuration and Control," for information on installing and setting up the Windowall software, which is provided with your WindoWall system. Refer to the WindoWall Console software help file for detailed information on using this software.

The WindoWall software enables you to enable and configure the following:

**Picture controls** — Picture controls allow you to adjust the size, position, brightness, contrast, color, tint, detail, and zoom for each window. The image within each window can be resized also, independently of its window.

**Text labels** — Each picture-in-picture window can be labeled with up to 16 characters. These labels can be customized for positioning, text color, character size, background, and border.

**Window and input presets** — Window presets save window sizing, positioning, and priority information. Input presets save input signal type information and picture control settings.

**Freeze control** — Freeze control freezes (locks) a window to the current image.

**Video wall virtual canvas** — Virtual canvas enables on-screen video wall visualization and dynamic window placement/sizing.

**Background image management** — Image files can be uploaded and stored in memory on the MGP. You can then browse to these image files and select them for use as the background image on the video wall canvas. The MGP can store up to six high resolution images, enabling you to to easiily display frequently used images such as a company logo.

**Auto Image™** — The Auto Image feature automatically sizes, centers, and optimizes the image to the scaled output rate, filling the window.

**Remote operation** — WindoWall is operated remotely via the Ethernet interface, using the WindoWall Console application.

**Third party window preset recall** — Window presets that were configured and saved in the WindoWall Console application can later be recalled remotely by user-friendly text strings issued to the primary MGP. The primary MGP coordinates with the other MGPs and the matrix switcher to recall the preset and the inputs that were displayed in the windows.

**Internal test patterns** — The MGP provides a range of 15 test patterns, including a crop pattern, crosshatch, 16-bar grayscale, Color Bars, and patterns for setting up side-by-side windows. It also features a blue-only mode for proper setup of video color and tint levels.

**Rack mounting** — The 2U high and full rack wide metal enclosure can be rack mounted using the included mounting brackets.

**Internal international power supply** — The 100-240 VAC, 50/60 Hz internal power supply provides worldwide power compatibility.

**3:2 pulldown detection for NTSC video and 2:2 film detection for PAL** — These advanced film mode processing features help maximize image detail and sharpness for video sources that originated from film.

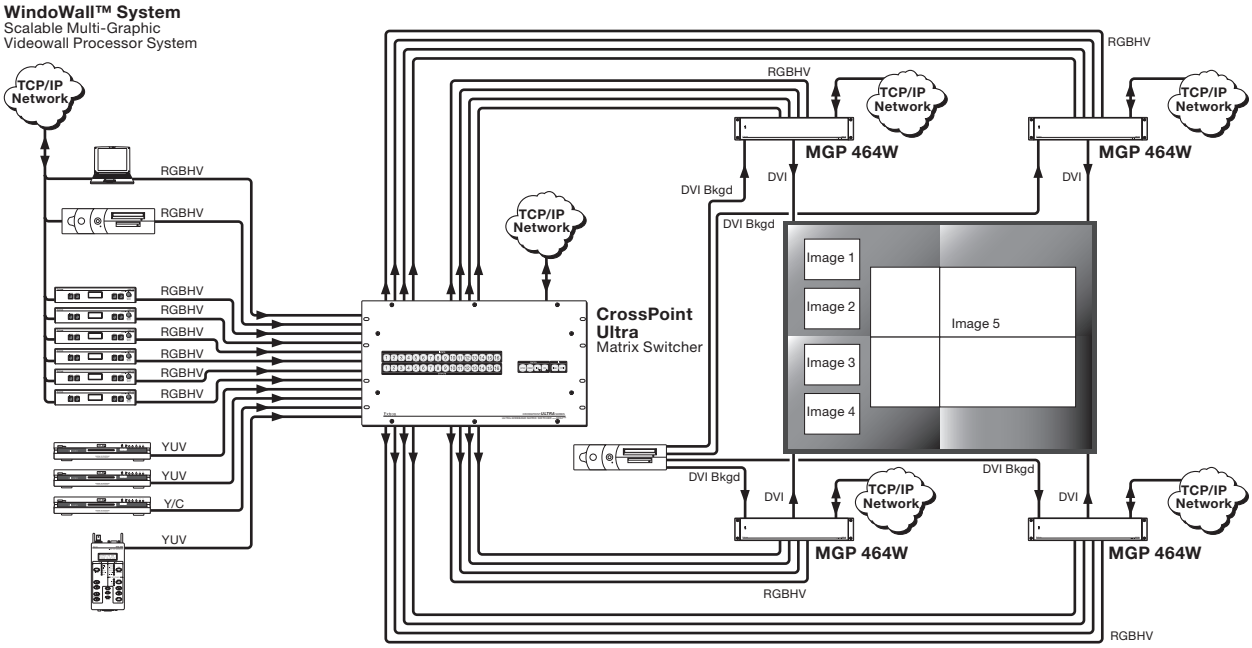
When film is converted to NTSC video, the film frame rate has to be matched to the video frame rate in a process called 3:2 pulldown. Jaggies and other image artifacts can result if conventional deinterlacing techniques are used on film-source video.

The MGP 464W's advanced film mode processing recognizes signals that originated from film. The MGP then applies video processing algorithms that optimize the conversion of video made in the 3:2 pulldown process. This results in richly detailed images with sharply defined lines.

A similar process, 2:2 film detection, is used for PAL film-source video.

## Application Diagram

The following application diagram shows an example in which four MGP 464W processors are used with an Extron CrossPoint Ultra matrix switcher in a video wall system.




***Connection diagram for MGP 464W***

# Chapter Two

# Installation and Operation

Installation Overview

Mounting the MGP 464W

Rear Panel Features

Front Panel

Resetting

# Installation and Operation

## Installation Overview

To install and set up multiple MGP 464W processor units for a video wall, follow the steps below. (The WindoWall Console software can control up to 16 MGPs in a video wall application.) See the application diagram in chapter 1, "Introduction," for a connection example.

1. Disconnect power from the MGPs, and turn off all other devices that will be connected.
2. If desired, mount the MGPs. (See "Mounting the MGP 464W," in the next section.)
3. Attach all video sources to the input connectors of a matrix switcher such as the Extron CrossPoint 450 Plus.
4. If using DVI inputs with the MGP 464W DI, connect each DVI input source to a DVI distribution amplifier (DA), such as the Extron DVI DA 4.
5. Connect the matrix switcher's video outputs to the MGP's four sets of BNC input connectors.
6. If using DVI inputs, attach each DA to one of the MGP 464W DI's input connectors.
7. Connect the video wall displays to the MGPs' RGBHV/YUV BNC output connectors and/or to their DVI-I output connectors.
8. Connect an active LAN Ethernet cable to the RJ-45 port on the MGP rear panel to establish a link to the network.
9. Power up the input and output devices, then connect power to the MGP.
10. Install and set up the WindoWall™ Console software on your computer. (See "Setting Up the WindoWall™ Console Software" in chapter 3, "Software-based Configuration and Control.")

**NOTE** *Step 10 can be performed without the inputs, switcher, or any other hardware connected to the MGP.*

## Mounting the MGP 464W

### Tabletop use

Four self-adhesive rubber feet are included with the MGP 464W. For tabletop use, attach one foot to each corner of the bottom of the unit and place the unit in the desired location.

### Rack mounting

#### UL guidelines for rack mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the MGP into a rack:

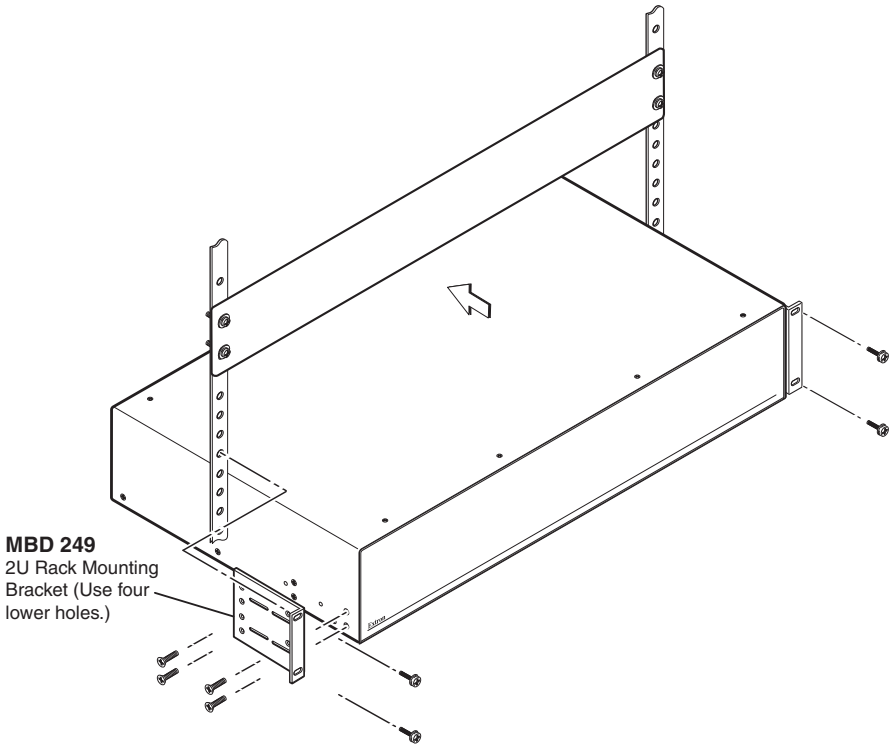
- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- **Reduced air flow** — Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

- **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.
- **Circuit overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable earthing (grounding)** — Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).

## Rack mounting procedure

For optional rack mounting, do not install the rubber feet. To mount the MGP 464W in a rack, follow these steps:

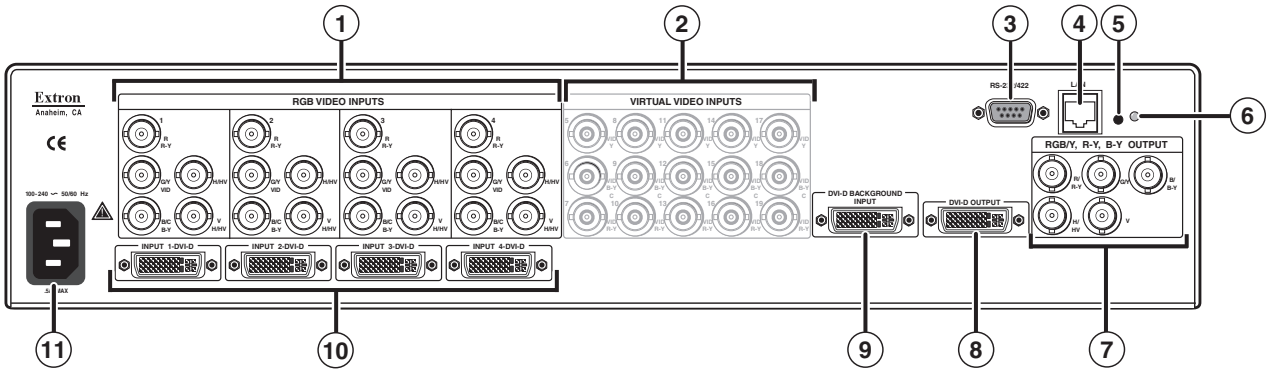
1. Attach the included mounting brackets (part **#70-155-01**) to the unit, using eight of the machine screws supplied with the mounting kit. (See the illustration below.)
2. Insert the unit into the rack, and align the holes in the mounting brackets with the holes in the rack. Use four machine screws to attach the brackets to the rack.




***Rack mounting the MGP 464W***

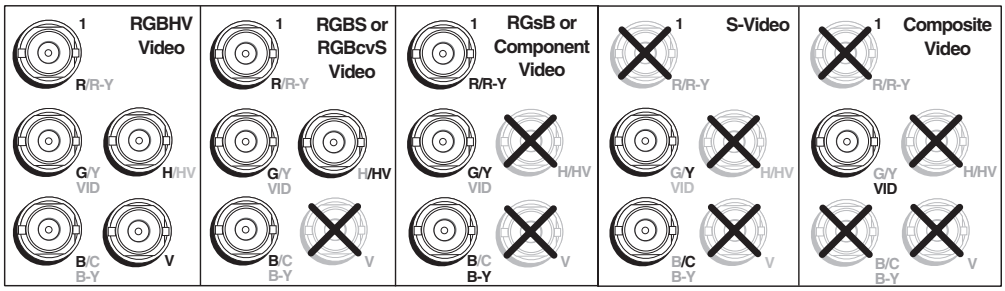
## Rear Panel Features

The diagram below shows the rear panel of the MGP 464W DI, which has four DVI-I connectors (⑩ in the illustration below). The standard MGP 464W does not have DVI capability, and therefore does not have these connectors. In all other respects the MGP 464W and the MGP 464W DI rear panels are identical.




***MGP 464W DI rear panel***

① **Inputs 1, 2, 3, and 4 —** Plug RGB, high or standard definition component video, S-video, or composite video sources into these fully configurable BNC connectors, as shown in the following diagram. These connectors can be configured for the desired signal types via the WindoWall Console software.

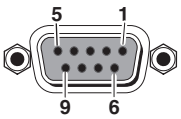



***Connecting to RGB/HD/Video inputs 1 through 4***

② **Virtual inputs** — Not used

③ **RS-232/422 connector** — Plug a computer or other RS-232 or RS-422 host device into this connector. Wire the connector as shown on the next page. See chapter 3, "Software-based Configuration and Control," for more information on controlling the MGP 464W remotely.

The pin assignments for the 9-pin RS-232/422 connector (shown at right) are shown in the tables on the next page.

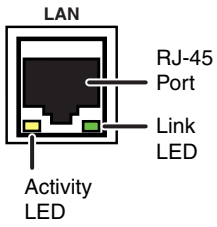



**NOTE** *The cables used to connect the RS-232/422 ports to a computer or control system may need to be modified by removing pins or cutting wires. If unneeded pins are connected, the processor may cease functioning.*

| Pin | RS-232 function | Description |
|---|---|---|
| 1 | – | No connection |
| **2** | **Tx** | **Transmit data** |
| **3** | **Rx** | **Receive data** |
| 4 | – | No connection |
| **5** | **Gnd** | **Signal ground** |
| 6 | – | No connection |
| 7 | – | No connection |
| 8 | – | No connection |
| 9 | – | No connection |

| Pin | RS-422 function | Description |
|---|---|---|
| 1 | – | No connection |
| **2** | **Tx-** | **Transmit ground** |
| **3** | **Rx-** | **Receive ground** |
| 4 | – | No connection |
| **5** | **Gnd** | **Signal ground** |
| 6 | – | No connection |
| 7 | **Rx+** | **Receive data** |
| **8** | **Tx+** | **Transmit data** |
| 9 | – | No connection |

④ **LAN connector** — To use the WindoWall software to configure and control the MGP 464W, plug an RJ-45 network cable into this connector to connect the unit to a network (via a switch, hub, or router) or to a single computer.

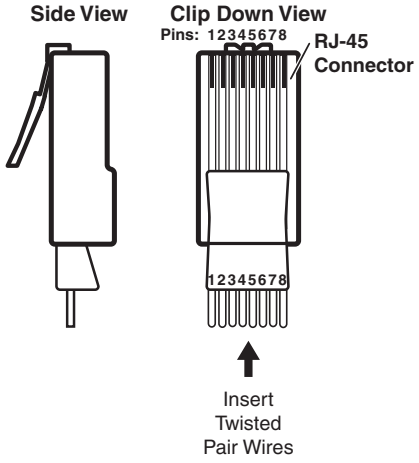



**Activity LED** — This yellow LED blinks to indicate network activity.

**Link LED** — This green LED lights to indicate a good network connection.

Use a straight-through cable to connect to a network, or a crossover cable to connect directly to a computer.

- For 10BaseT (10 Mbps) networks, use a Cat 3 or better cable.
- For 100BaseT (max. 155 Mbps) networks, use a Cat 5 cable.




**Straight-through Cable**
(for connection to a switch, hub, or router)

| End 1 | | End 2 | |
|---|---|---|---|
| Pin | Wire Color | Pin | Wire Color |
| 1 | white-orange | 1 | white-orange |
| 2 | orange | 2 | orange |
| 3 | white-green | 3 | white-green |
| 4 | blue | 4 | blue |
| 5 | white-blue | 5 | white-blue |
| 6 | green | 6 | green |
| 7 | white-brown | 7 | white-brown |
| 8 | brown | 8 | brown |

**Crossover Cable**
(for direct connection to a PC)

| End 1 | | End 2 | |
|---|---|---|---|
| Pin | Wire Color | Pin | Wire Color |
| 1 | white-orange | 1 | white-green |
| 2 | orange | 2 | green |
| 3 | white-green | 3 | white-orange |
| 4 | blue | 4 | blue |
| 5 | white-blue | 5 | white-blue |
| 6 | green | 6 | orange |
| 7 | white-brown | 7 | white-brown |
| 8 | brown | 8 | brown |

### *Wiring the LAN port*

You will also need to configure the LAN port before using it. This is done by using SIS commands. See "Command/response table for SIS commands" in chapter 3, "Software-based Configuration and Control," for details.

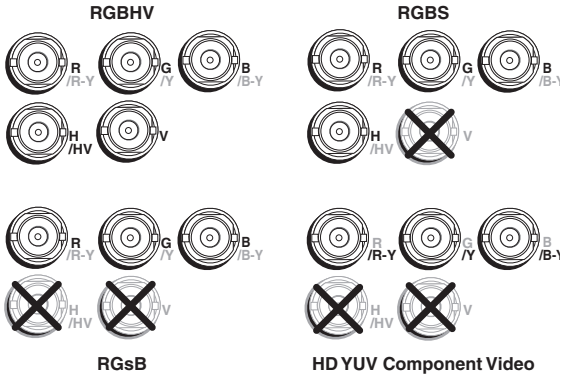
The LAN port defaults are:

- IP address: 192.168.254.254
- Gateway IP address: 0.0.0.0
- Subnet mask: 255.255.0.0
- DHCP: off

⑤ **Reset button** — Pressing this recessed button causes various IP functions and Ethernet connection settings to be reset to the factory defaults.

⑥ **Reset LED** — This green LED, located to the upper-right of the reset button, blinks a varying number of times to indicate which reset mode has been entered. See "Resetting," later in this chapter, for details.

⑦ **BNC output connectors** — Plug an output device into this 5-BNC connector, as shown below.




***Connecting to output BNC connectors***

⑧ **DVI output** — Plug a DVI output device into this DVI-I connector.

**NOTE** *Analog RGB is not available on the DVI-I connector.*

**NOTE** *When two output devices are attached (one to each output connector), they both display the same image.)*

⑨ **DVI background input** — Connect a DVI input source to this DVI-I connector in order to display the DVI video source live as a background on your output screen. The four MGP windows are displayed in front of this DVI image. When a DVI background is used, the MGP output is locked to the input rate of the DVI background. This input is not scaled.

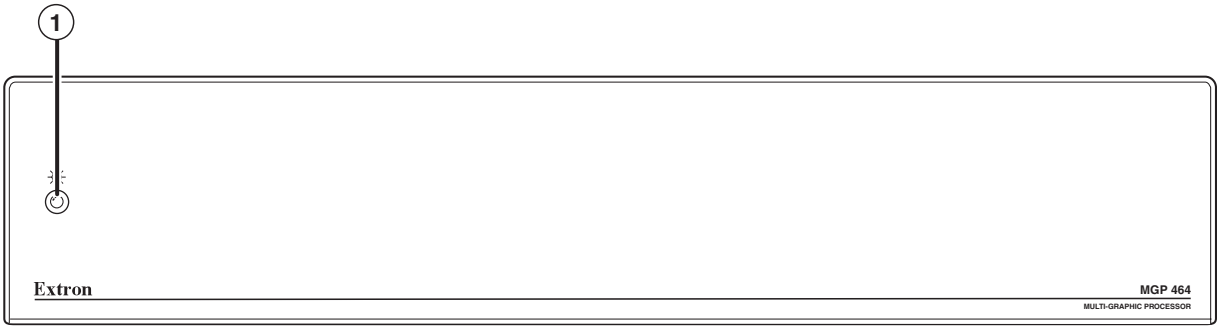
**NOTE** *This input connector can be used only to receive the background image. The input is not scaled or processed. To process DVI input signals, you must use the MGP 464W DI model.*

⑩ **DVI inputs 1, 2, 3, and 4 (MGP 464W DI only)** — Connect up to four DVI input sources to these DVI-I input connectors. These inputs are available only on the MGP 464W DI model.

**NOTE** *If the DVI source will be displayed on multiple cubes, the DVI signal must be distributed to all MGPs.*

⑪ **AC power connector** — Plug the power cord provided with the MGP into this connector to connect the MGP to a 100–250 VAC, 50/60 Hz power source.

## Front Panel




***MGP 464W front panel***

① **Indicator LED** — This green LED lights while the MGP is receiving power.

## Resetting

Resetting the unit causes various IP functions and Ethernet connection settings to revert to factory defaults. There are four reset modes (numbered 1, 3, 4, and 5 for the sake of comparison with Extron IP Link products) that are available by pressing the Reset button on the rear panel. The Reset button is recessed, so you must use a pointed stylus, ballpoint pen, or Extron Tweeker to press it. See the table on the next page for a summary of the reset modes.

**CAUTION** *Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or processor reboot.*

**NOTE** *These resets close all open IP and Telnet connections and all sockets. Each mode is a separate function, not a continuation/progression from mode 1 to mode 5.*

### Reset Mode Comparison/Summary

| Mode | Activation | Result | Purpose/Notes |
|---|---|---|---|
| 1 | Hold in the recessed Reset button (located next to the LAN connector) while applying power to the unit. | **Mode 1 causes the MGP to revert to the factory default firmware.** Event scripting does not start if the unit is powered on in this mode. All user files and settings (drivers, audio adjustments, IP settings, etc.) are maintained. | Use mode 1 to remove a version of firmware if incompatibility issues arise. |
| **3** | Hold in the Reset button for 3 seconds, until the Reset LED blinks once. Then, within 1 second, press Reset again briefly (for less than 1 second). | **Mode 3 turns events on or off.** During resetting, the Reset LED flashes 2 times if events are starting; 3 times if events are stopping. | Events must be turned on if you want to change IP settings or scheduling. |
| 4 | Hold in the Reset button for 6 seconds, until the Reset LED has blinked twice: once at 3 seconds and once at 6 seconds. Then, within 1 second, press Reset briefly (for less than 1 second). | **Mode 4 does the following:**<br>• Enables ARP capability.<br>• Sets the IP address back to factory default.<br>• Sets the subnet back to factory default.<br>• Sets the default gateway address back to the factory default.<br>• Sets port mapping back to factory default.<br>• Turns DHCP off.<br>• Turns all events off.<br>The Reset LED flashes 4 times in quick succession during reset. | Mode 4 enables you to set IP address information using ARP and the MAC address. |
| 5 | Hold in the Reset button for 9 seconds, until the Reset LED has blinked three times: once at 3 seconds, once at 6 seconds, and once at 9 seconds. Then, within 1 second, press Reset briefly (for less than 1 second). | **Mode 5 performs a complete reset to factory defaults (except the firmware).**<br>• Does everything mode 4 does.<br>• Resets everything that was set via the Real Time Adjustments part of the control program: all video settings and miscellaneous options.<br>• Resets all IP options.<br>• Removes/clears all files from the processor.<br>The Reset LED flashes 4 times in quick succession during the reset. | Mode 5 is useful if you want to start over with control software configuration and uploading, and to replace events. |

3

# Chapter Three

## Software-based Configuration and Control

Setting Up the WindoWall™ Console Software

Setting Up RS-232/422 Communication

Using Simple Instruction Set (SIS) Commands

## Setting Up the WindoWall™ Console Software

The WindoWall Console application software is the user interface to the WindoWall system. It brings all the MGP 464W processors together via TCP/IP and enables you to set up, create, and manage your video wall system. The software includes wizards that take you through step-by-step procedures to configure the input sources and the matrix switcher for the video wall. After completing the setup, you can create additional customized window layouts using the virtual canvas provided by the software, and save these layouts to up to 100 memory presets for future recall.

**NOTE** *Some configuration and control procedures can also be performed via the MGP 464/MGP 464W Web pages. See chapter 4, "Ethernet-based Configuration and Control," for information on using the Web pages.*

### Installing and starting the software

You can complete the following startup procedure on the MGP either before or after you connect the other hardware (inputs, outputs, and switcher) to it.

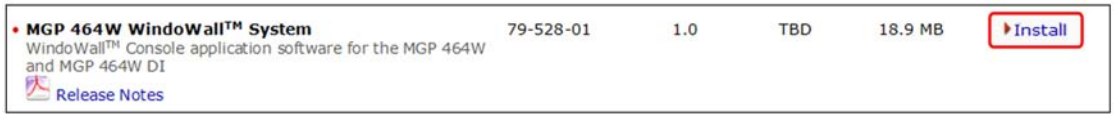
1. Insert the provided CD ROM into your computer's CD drive. The disk should start automatically. If it does not, locate the LAUNCH.EXE file name on the CD drive and double-click on it. The Extron Software Products screen opens.

**NOTE** *If the WindoWall software does not appear on the CD provided with your MGP, download it from the Extron Web site. See "Downloading the WindoWall Console program from the Web," later in this chapter.*

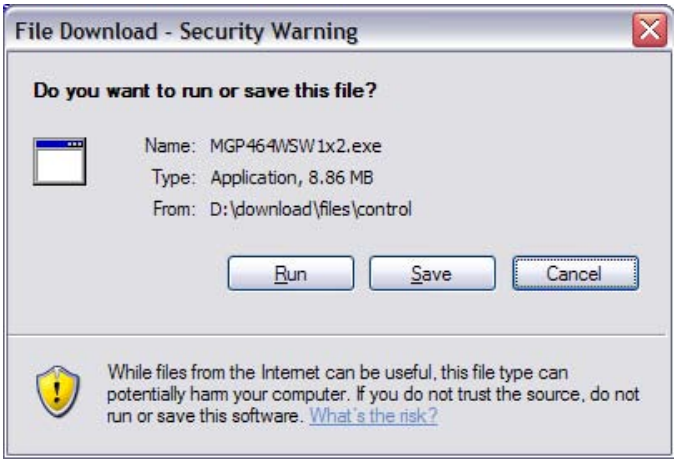
Extron Electronics
Extron Software Products
Disc B: Issue 2008.3
800.633.9876
Products
Software
Manuals
Home
extron.com
Contact Us
<click to select product>
List Part Numbers
What's New Since Last Issue
www.extron.com
For the latest product information, visit www.extron.com
Extron Software Products
Disc B: Issue 2008.3
For more than 20 years, Extron Electronics has manufactured professional A/V system products, including computer-video interfaces, switchers, matrix switchers, distribution amplifiers, signal processing devices, Ethernet control interfaces, and high resolution cable. Extron offers solutions for integration of video and audio into presentation systems for a variety of environments, such as boardrooms, classrooms and training centers, lecture halls, command and control centers, and more.
Products
Find a product, and view available files.
Software
Install control and configuration software.
Get viewers & utilities here
DirectX
DirectX is a Windows technology that enables higher performance in graphics and sound on your PC. Required for use with IP Intercom HelpDesk software. Install it now
Microsoft .NET Framework
The .NET Framework runtime and associated files are required to run applications developed to target the .NET Framework v2.0. Required for use with IP Intercom HelpDesk software.
Install it now
Acrobat Reader
Adobe® Acrobat® Reader™ is a free download that is necessary for viewing PDF ('Portable Document Format') files. Extron files offered in this format include the catalog pages, brochures, user manuals, and product specifications. Install it now
JS Installer 5.6
This is the updated JavaScript engine for Windows that is needed for correct operation of Global Viewer and must be loaded on any client machines that plan to access the application.
Install it now
Visit www.extron.com to check for updates.
requires internet connection

***Link to the installation software on the MGP 464W CD***

2. On the software products screen, click the **Software** icon (circled in the illustration on the previous page).
3. Scroll to locate the MGP 464W software description, and click the **Install** link at the far right.




4. On the File Download window that appears, click **Run** to begin installing the program.


File Download - Security Warning
Do you want to run or save this file?
Name: MGP464WSW1x2.exe
Type: Application, 8.86 MB
From: D:\download\files\control
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?

***File Download window example***

(If you want to save the installation file (MGP464WSW1x*N*.exe) to your desktop to run later, click **Save**. On the Save As window, save the setup file to the desired location on your computer.)

5. On the second security prompt that opens, click **Run** again.
6. Follow the instructions on the InstallShield Wizard screens to complete the program installation.

   By default the installation creates a folder called "WindoWallConsole" in the following location on the computer:

   **c: \Program Files\Extron\WindoWallConsole**

   If there is no Extron folder in your Program Files folder, the installation program creates it as well.

## Downloading the WindoWall Console program from the Web

The WindoWall Console software is also available on the Extron Web site at **www.extron.com**. From this site, you can also download updates to the WindoWall software as they become available.

To access the software on the Web,

1. Open the Extron Web page, and select the Download tab.
2. On the Download Center screen, click the **Control Software** button (shown at right). A Control Software screen is displayed, containing a list of control software products.

3. In one of the linked alphabets displayed across the top and bottom of the screen, click **M**.
4. On the "M" software products page, scroll to locate MGP 464W, and click the **Download** link at the far right.
5. On the next screen, fill in the required information.
6. Click the **Download MGP464WSW1x*N*.exe** button.
7. On the File Download - Security Warning window that appears, click **Run** to begin downloading the installer file.

   (If you want to save the installation file (MGP 464WSetupv1_*n*.exe) to your computer hard drive to run later, click **Save**. On the Save As window that opens, save the setup file to the desired location. When you are ready to install the software, double-click on the MGP464WSW1x*N*.exe icon, click **Run** on the download screen that opens, and restart this procedure at step **8**.)
8. On the second security prompt window that opens, click **Run** again to start the installation process.
9. Follow the instructions on the InstallShield Wizard screens to complete the software program installation. By default the installation creates a folder called "WindoWallConsole" in the following location on the computer:

   **c: \Program Files\Extron\WindoWallConsole**

   If there is no Extron folder in your Program Files folder, the installation program creates it as well.

## Starting up the WindoWall software

To start using the WindoWall Console software,

1. Open the software program by clicking on the WindoWall file icon, located at **All Programs > Extron Electronics > WindoWall Console > WindoWall Console**, on your computer's Start menu.

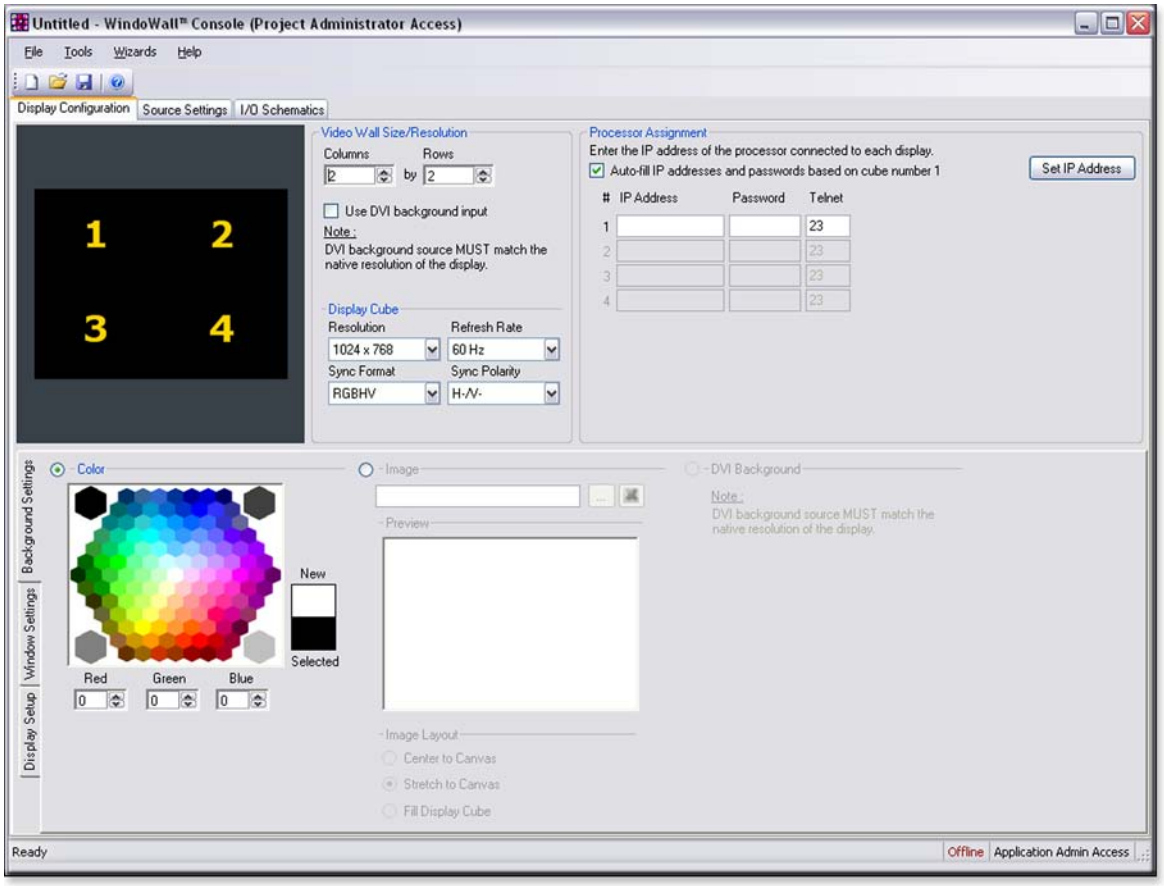
   - If no password has been set by your system administrator, an introductory screen appears briefly, then the WindoWall main window opens.
   - If a password has been set, the following screen appears.

***WindoWall login screen***

a. If the password is not already entered and masked, enter the password in the Login Password field.

**NOTE** *The password is case sensitive.*

b. Click **Login**. The WindoWall main window opens.




***WindoWall Console main window***

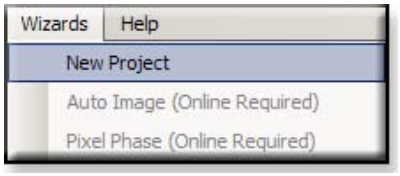
2. Set up a new WindoWall project (see "Setting up a WindoWall project," below) or open an existing one (refer to the WindoWall software help file).

## Setting up a WindoWall project

To set up the WindoWall software to configure and operate your WindoWall system, you must create a new project. This section describes the procedure for creating a new project using the New Project Wizard.

**NOTE** *You can also create (or edit) a project by entering the information on the Display Configuration, Source Settings, and I/O Schematic tabs. See the WindoWall Console help file for more information on using these screens.*

1. From the Wizards menu, select **New Project**.

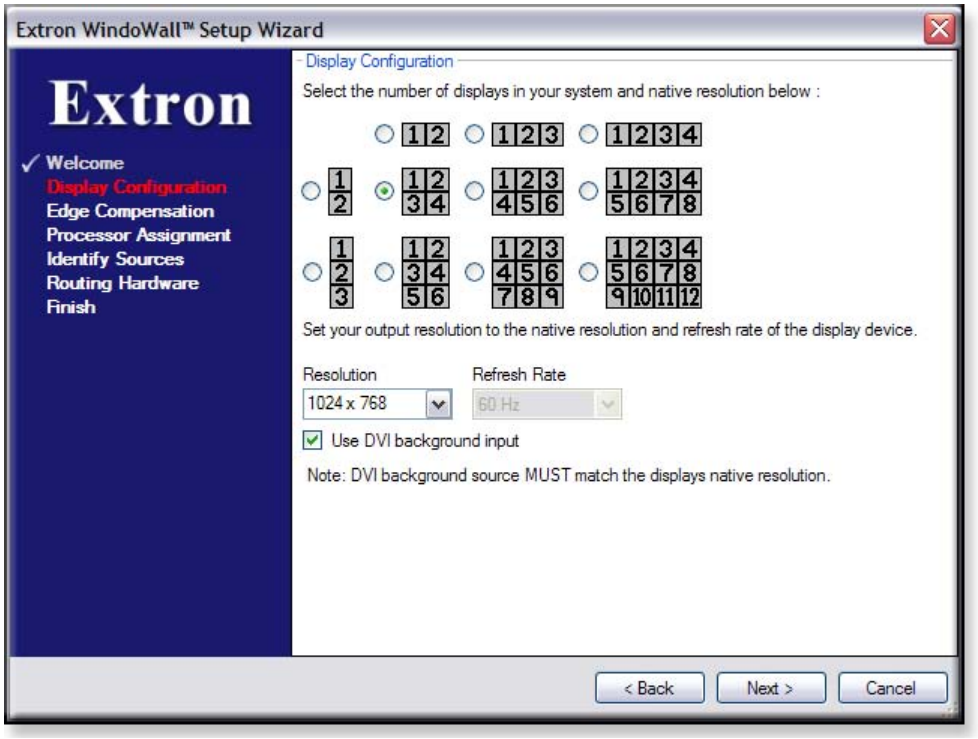


2. The WindoWall Setup Wizard opens with a screen outlining what the wizard covers. Click **Next** to begin setting up the new project.
3. On the Display Configuration window, enter information about the output displays on your video wall.
   - Select the number and horizontal/vertical configuration of your displays.

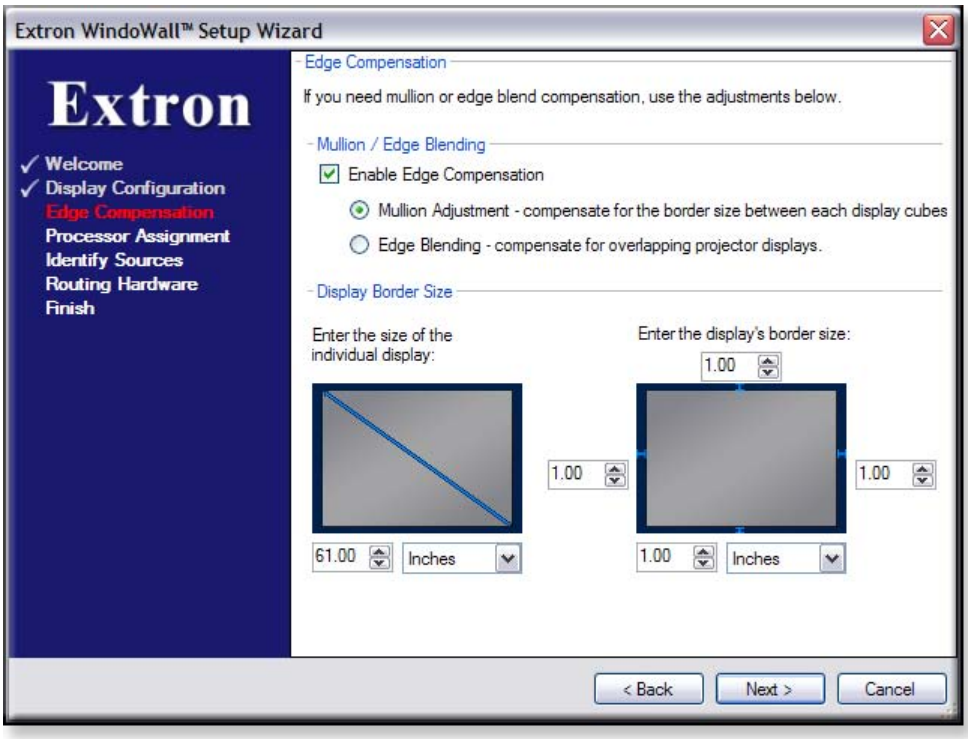
     **NOTE** *If your display configuration is not shown in this window, select the closest one. You can modify it after completing the wizard.*
   - From the two drop-down menus, select the resolution and refresh rate for your displays.
   - If you want to use the unscaled image from a DVI input source as a live background on the displays, select the **Use DVI background input** check box.

     When a DVI background is used, the selected resolution is the EDID information provided to the DVI source.

   Click **Next** when finished with this screen.



4. (Optional) Define the size of the display's borders using the Edge Compensation screen. Select the **Enable** check box to enable the fields on this screen.



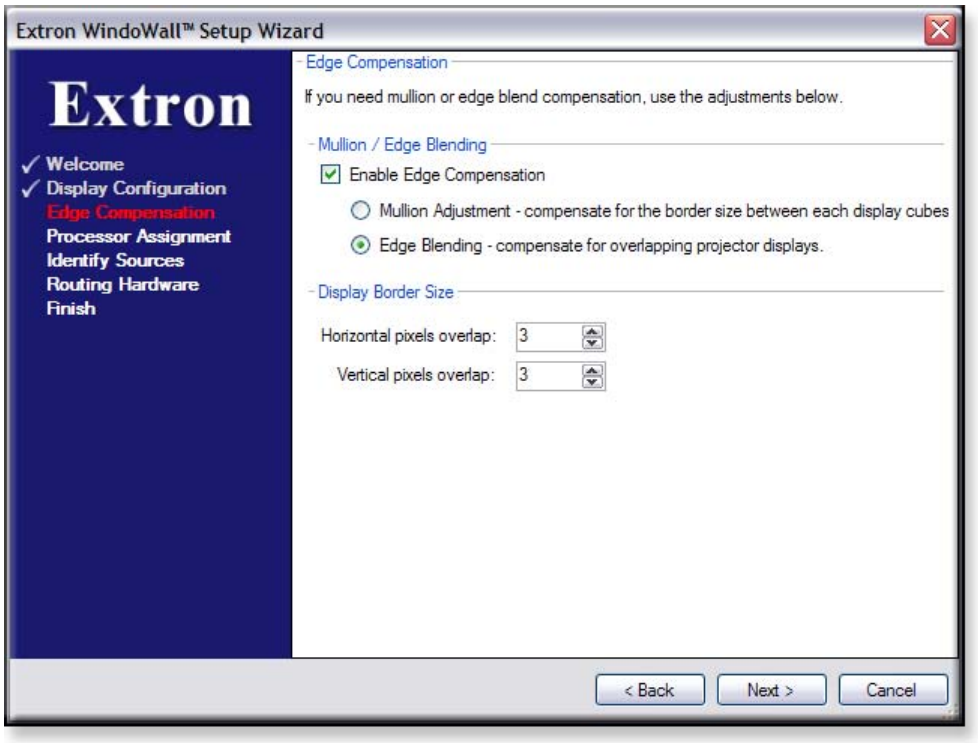

The Edge Compensation screen contains the following:

- **Mullion Adjustment radio button** — Select this button if you need to compensate for the border spaces around the displays. When you select Mullion Adjustment, the following fields are displayed:
  - **Enter the size of the individual display** — Type or use the incremental spin boxes and drop-down menus to select the diagonal size and unit of measure of the individual displays.

    **NOTE** *These fields are not available if* **Pixels** *is selected as the unit of measure for the display's borders (see the next bullet).*
  - **Enter the display's border size** — Type or use the incremental spin boxes and drop-down menus to select the sizes and unit of measure for each of the displays' borders.

- **Edge Blending radio button** — Select this button if you are using projectors to display multiple images on one screen, and you need to compensate for overlapping edges. The Edge Compensation screen changes as shown below.

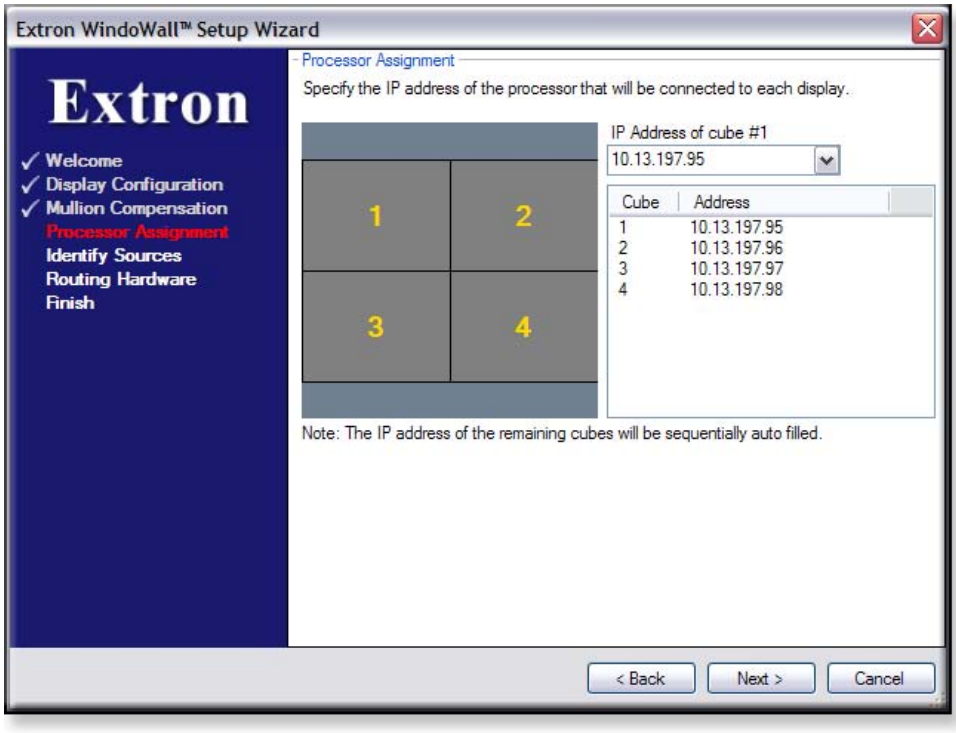
  **NOTE** *The MGP does not manage the brightness compensation associated with edge blended images. The WindoWall Console software supports projectors that have edge blending functionality built in. (See chapter 5, "Special Application: Edge Blending," for more information.)*




  - **Horizontal pixels overlap** — Type or select the number of pixels by which the images' right and left borders will overlap each other.
  - **Vertical pixels overlap** — Type or select the number of pixels by which the images' top and bottom borders will overlap each other.

Click **Next** when finished.

5. The Processor Assignment screen contains a diagram of the video wall configuration you selected in step **3**. In the "IP Address of cube #1" field, enter the IP address of the MGP that is connected to the display represented by square #1 in the diagram.




The wizard fills in IP addresses for the rest of the MGPs in your configuration, incrementing each successive address by 1. (If your MGPs' actual addresses do not match the ones that the wizard automatically entered, you can correct the addresses on the WindoWall Console main window after you complete the setup wizard.)

Click **Next** to display the next screen.

6. On the Identify Sources screen, enter information about your input sources as follows:

   **a.** In the **Name** field, enter a name for your first input, or leave the default name ("Source 1").

   **b.** In the **Source Icon** field, click on an icon that represents your first source. The available icons are listed in the table on the next page.

**NOTE** *Custom icons can be added through the WindoWall Console main window.*

**Input source icons**

| | | | |
|---|---|---|---|
| | DVD player | | Cable feed |
| | Laptop PC | | Camera |
| | MAC computer | | Map (PC) |
| | Desktop PC | | Media server |
| | Security camera | | Satellite |
| | Workstation PC | | TIVO |
| | VCR | | Test Generator |
| | Video Conferencing | | TV broadcast |

**c.** From the Video Format drop-down menu, select the format for your first source.

**d.** Select the **Dynamic Input** check box if the source input resolution is unknown or might vary (for example, in the case of a laptop input source, different laptops with different resolutions might be connected to the system). Selecting this check box allows the Auto Image option to be selected on the **Canvas** tab.

**e.** From the Aspect Ratio drop-down menu, select the default aspect ratio that the input source will have when it is added to the configuration. This source aspect ratio can subsequently be changed if desired.

Select the **Lock Aspect Ratio** check box if you want to specify that the window's aspect ratio can **not** be changed after the input has been added to the project. When the aspect ratio is locked, the window can still be resized.

**f.** When finished setting up the first input, click **Add**. The selected source icon and the name of the first source are displayed in the source list field to the right, categorized by signal type.

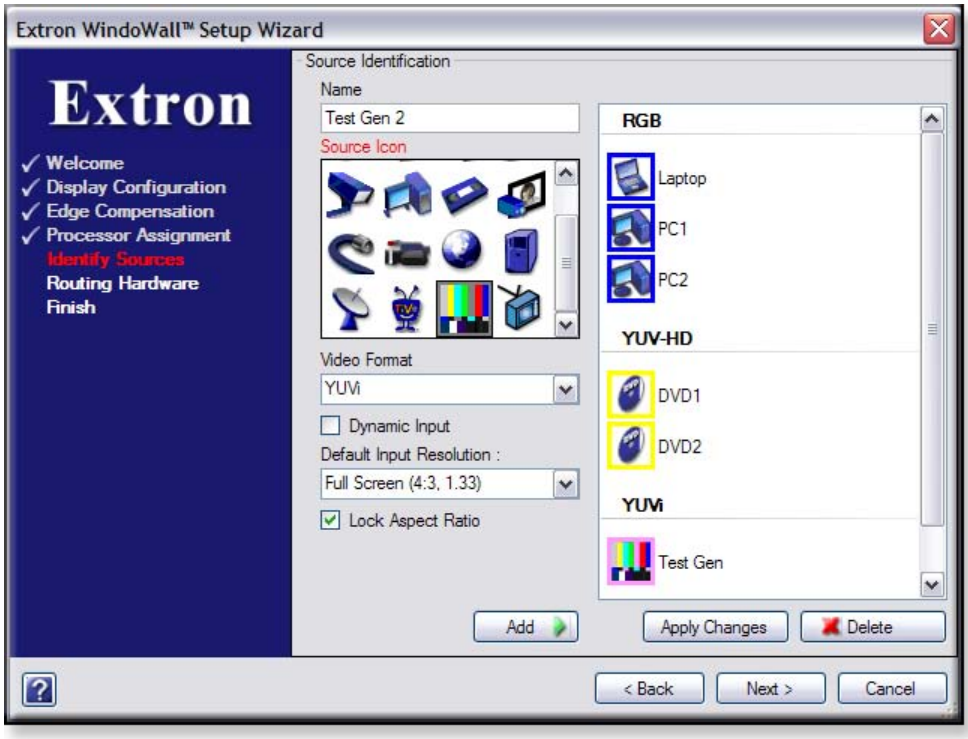
**g.** Repeat steps **a** through **f** for the rest of your input sources.

**To make changes to a source** — If you want to make changes at any time to an input listed in the source field, select the input name/icon. Its parameters are displayed in the fields to the left. Make any desired changes in those fields, then click **Apply Changes**.

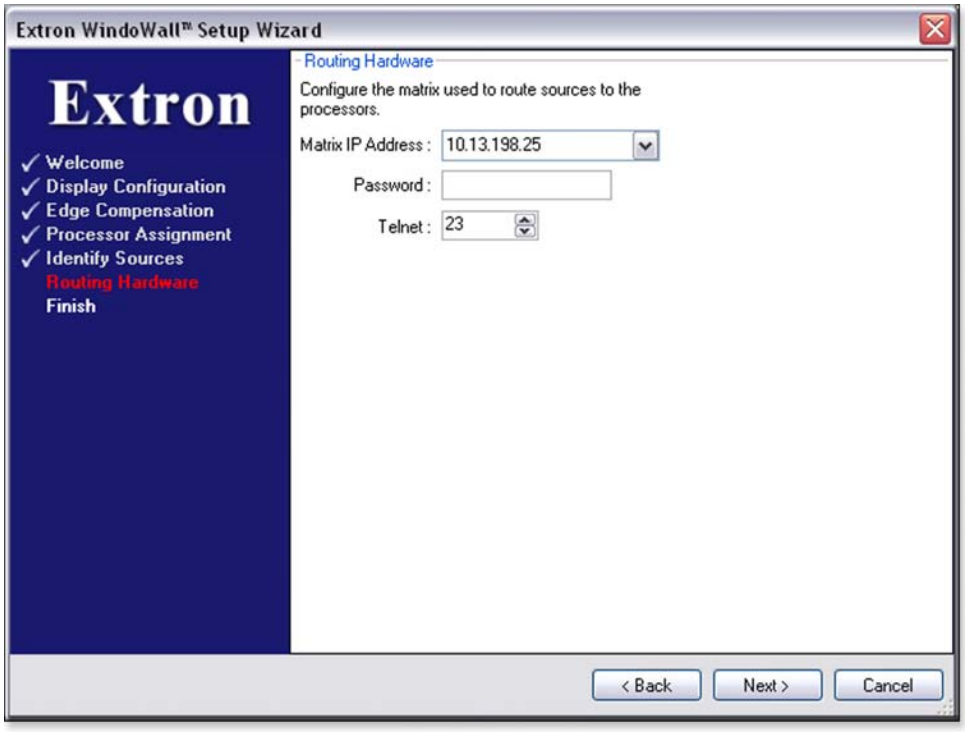
**To delete a source** — To remove a source from the list, select its name/icon, then click **Delete**.

Click **Next** when finished setting up input sources.

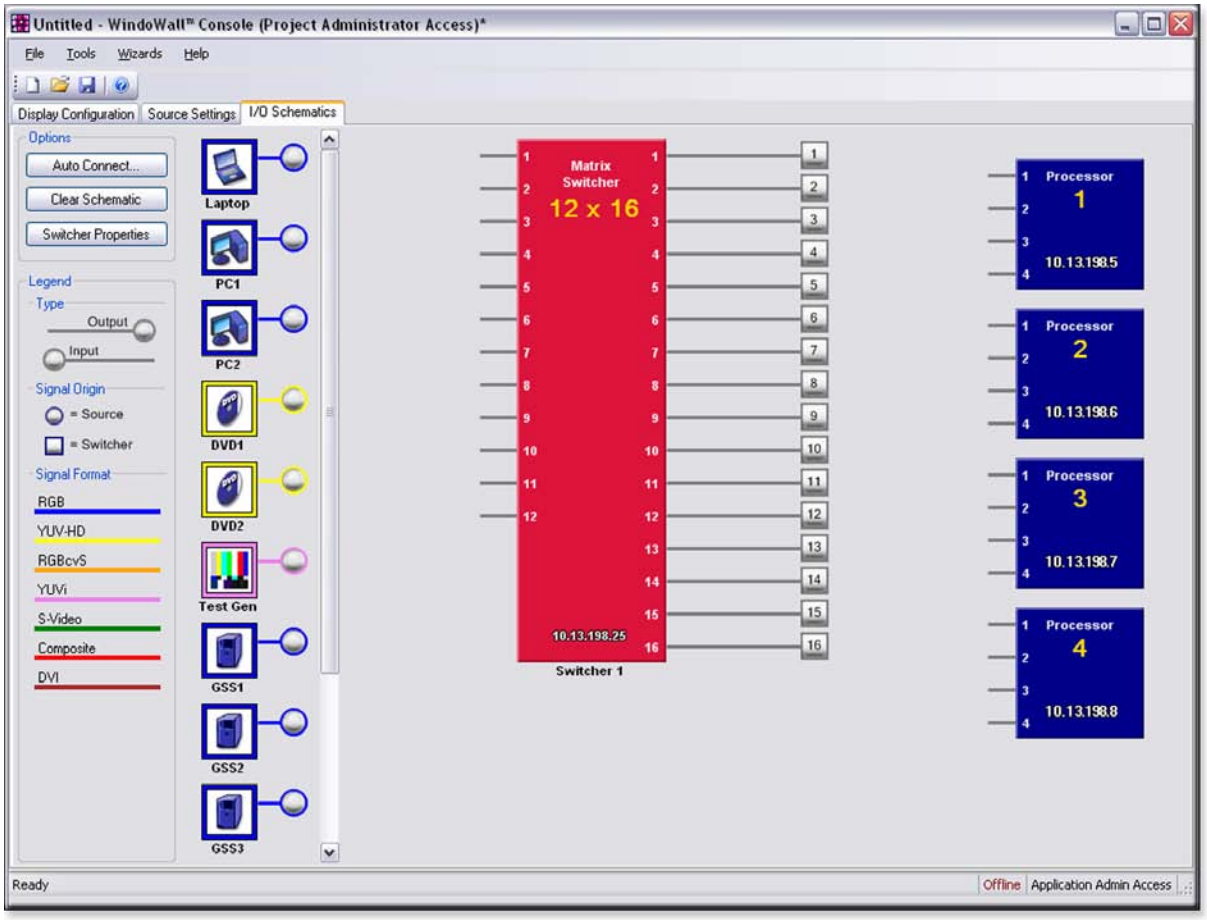
The figure on the next page shows a set of input sources that have been added to a configuration.




7. On the Routing Hardware screen, enter the IP address of the matrix switcher for your WindoWall system, and click **Next**.




8. On the Finish ("Congratulations") screen, click **Done**. The Wizard closes, and the I/O Schematics screen is displayed on the WindoWall Console window.

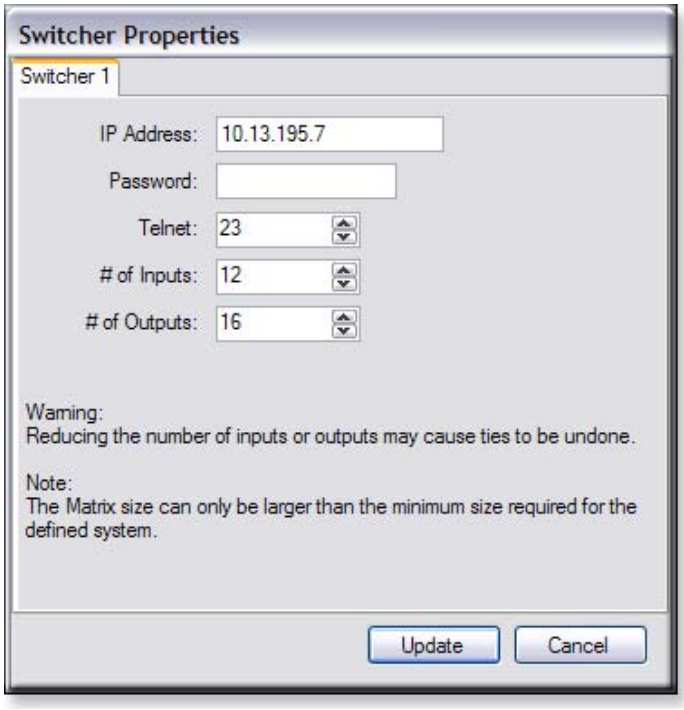



***I/O Schematics screen***

9. On the I/O Schematics tab, if necessary, redefine the switcher matrix size or any other switcher properties that may have changed.

   a. Click the **Switcher Properties** button in the Options section. (If this button is grayed out, click on the switcher diagram in the center of the screen to enable it.)

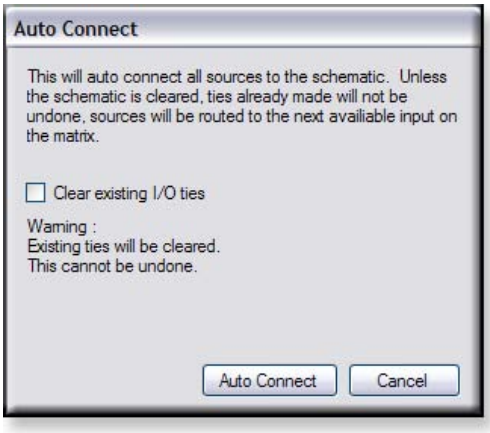
   b. On the Switcher Properties window, enter any changes to the switcher's IP address, Telnet port number, password, and/or number of inputs/outputs. (See the illustration on the next page.)




**10.** Specify the input connectors on the matrix switcher to which the input sources are attached and the switcher outputs to which the MGPs' inputs are attached, creating a connection diagram of your WindoWall system. You can do this in one of the following ways:

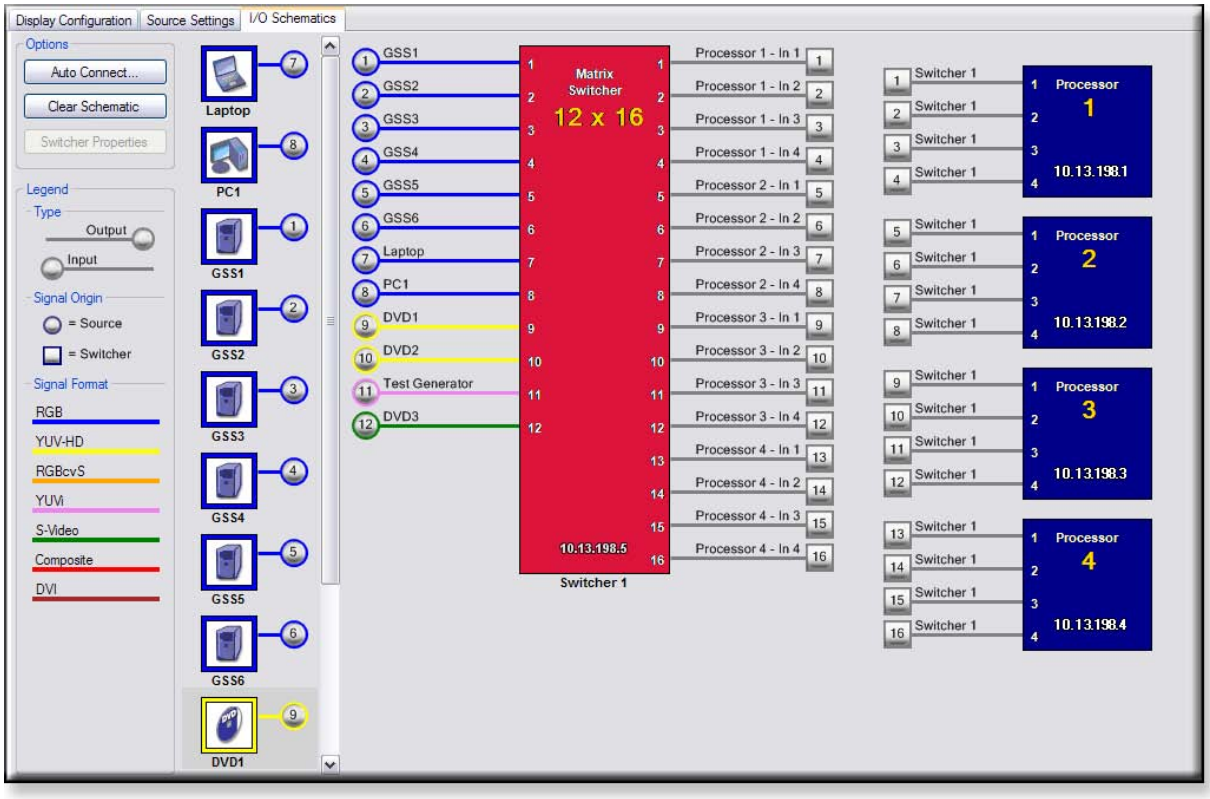
- **Auto Connect** — Click the **Auto Connect** button in the upper-left corner of the screen. This connects all input sources to the matrix switcher's inputs and all switcher outputs to the MGPs ("Processors"). The source connections are grouped by signal type (RGB, YUV, etc.), and arranged in alphabetical order by name within the signal category.

  When you click the **Auto Connect** button, the following prompt appears:


Auto Connect
This will auto connect all sources to the schematic. Unless the schematic is cleared, ties already made will not be undone, sources will be routed to the next availiable input on the matrix.
Clear existing I/O ties
Warning :
Existing ties will be cleared.
This cannot be undone.
Auto Connect
Cancel

  If you select the **Clear existing I/O ties** check box, any connections that you may have specified previously are removed before the new set of connections is made. If you do not select the check box, previous connections are retained and the new connections are added following them. (See the example on the next page.)

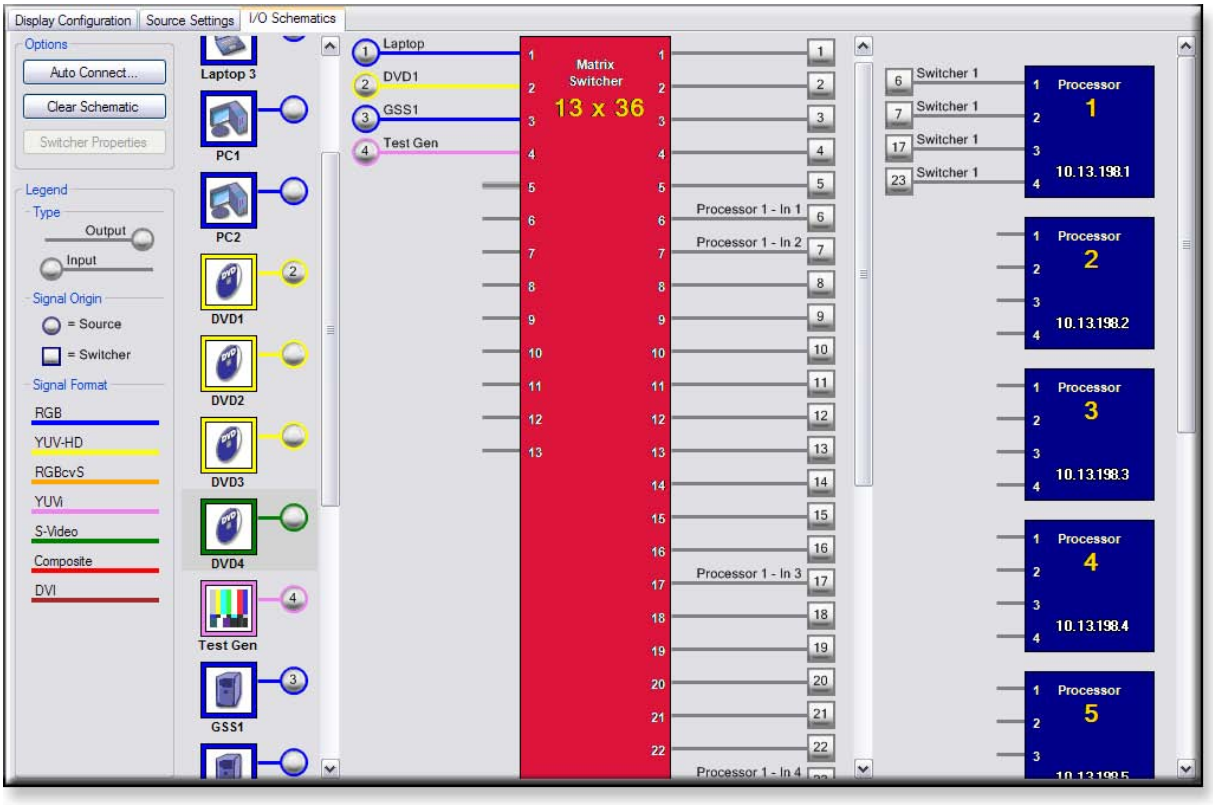
The following illustration shows a schematic diagram that was created by auto-connection.




***I/O Schematics screen with auto connected sources and processors***

- **Manually connect** — You can connect the inputs and the MGPs individually by dragging icons to the desired locations on the diagrams as follows:
  - Drag each source icon (for example, ) to the desired switcher input on the diagram in the center.
  - Drag each switcher output icon (for example, ) to the desired location on one of the Processor (MGP) diagrams at the right edge of the I/O Schematics screen.
  - To delete a tie, do either of the following:
    - Right-click on the tie to either the matrix switcher diagram or the appropriate MGP diagram, then click the **Delete** pop-up button that appears.
    - Place the mouse over the tie, then press the Delete key on your keyboard.

The illustration on the next page shows a schematic diagram being assembled manually.




***Manually connecting sources and processors on the I/O Schematics screen***

For details on using the I/O Schematic screen, select **Contents** from the Help menu to view the WindoWall Console help file.

**11.** If you want to make changes to your input sources at this point, select the **Source Settings** tab and make your changes and/or additions there, then select the **I/O Schematics** tab again.

**NOTE** *The diagram you create on the* **I/O Schematics** *tab* ***must*** *match the physical cabling in the WindoWall system.*

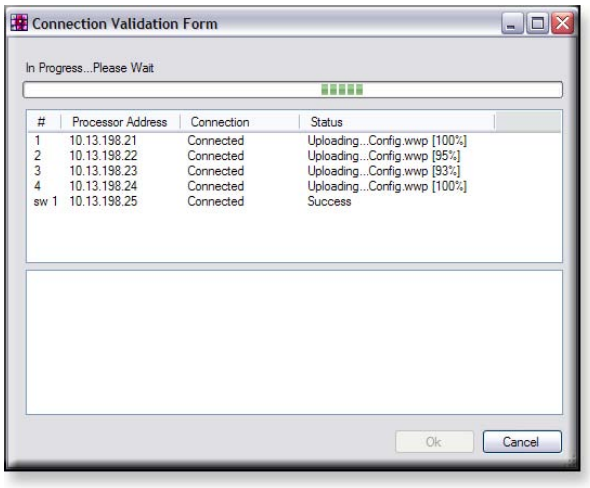
**12.** Save your completed configuration.

**a.** Select **Save Project As** from the File menu.

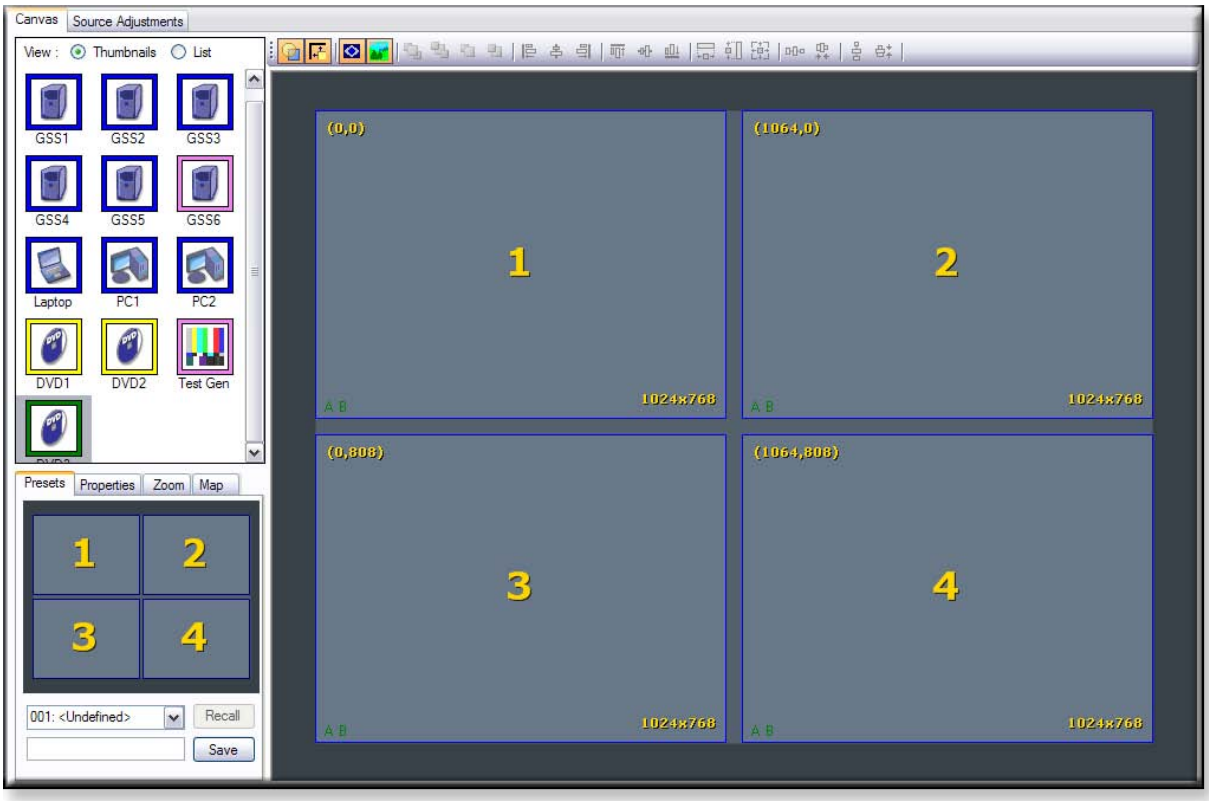
**b.** On the Save As window, enter a name for the configuration.

**c.** Browse to the location on your computer where you want to save the configuration, and click **Save**. The new configuration file name is displayed in the title bar of the WindoWall Console window.

13. From the Tools menu, select **Operate System** to connect online to the matrix switcher and the MGPs. (Be sure that you have access to these devices and that they have power.) While the software is verifying that the MGPs and the switcher are available, the following screen is displayed:




14. If the connections are successful, the software goes into operating mode, and the Canvas screen is displayed.



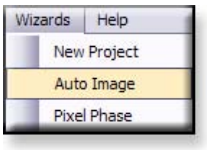

***Canvas tab on the WindoWall Console window in operating mode***

Run the Auto Image Wizard to configure the image sampling settings for the input sources that you have defined in this project (see the next section).

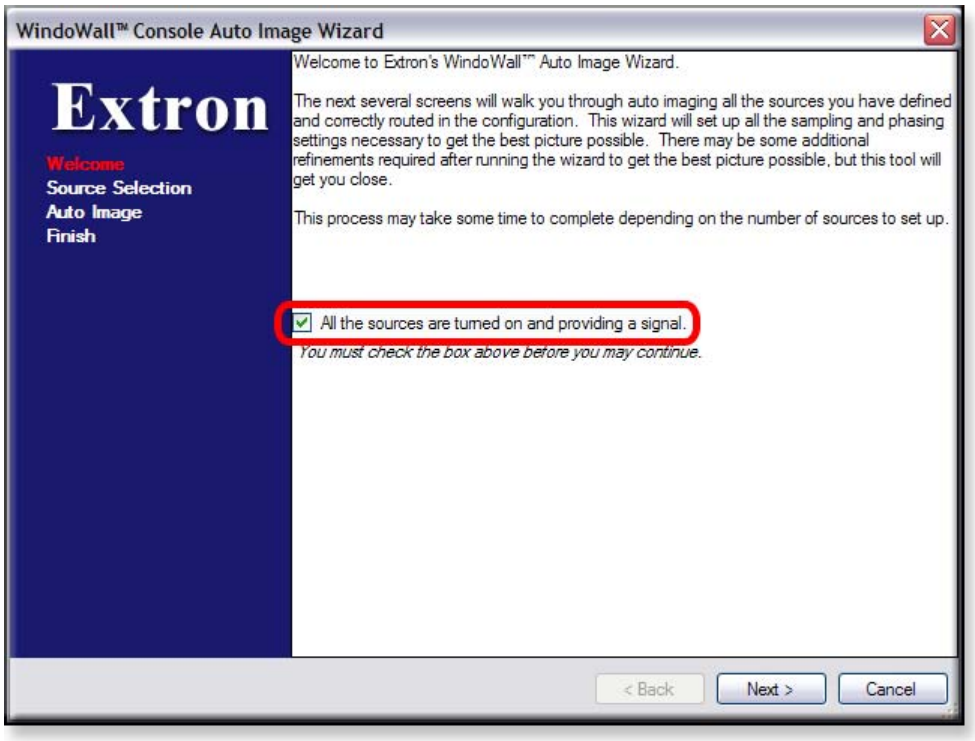
## Using the Auto Image Wizard

The Auto Image Wizard lets you set up the software to automatically configure the input sampling settings for all the sources that you defined in the project.

1. From the Wizards menu, select **Auto Image**. (This option is available only if your computer is online to the matrix switcher and the MGPs.)




2. On the Auto Image Wizard opening screen, select the check box. The **Next** button becomes available.


WindoWall™ Console Auto Image Wizard
Extron
Welcome
Source Selection
Auto Image
Finish
Welcome to Extron's WindoWall™ Auto Image Wizard.
The next several screens will walk you through auto imaging all the sources you have defined and correctly routed in the configuration. This wizard will set up all the sampling and phasing settings necessary to get the best picture possible. There may be some additional refinements required after running the wizard to get the best picture possible, but this tool will get you close.
This process may take some time to complete depending on the number of sources to set up.
All the sources are turned on and providing a signal.
You must check the box above before you may continue.
< Back
Next >
Cancel

3. Click **Next**. The source selection window opens, displaying icons for all the input sources that you identified in the Setup Wizard.

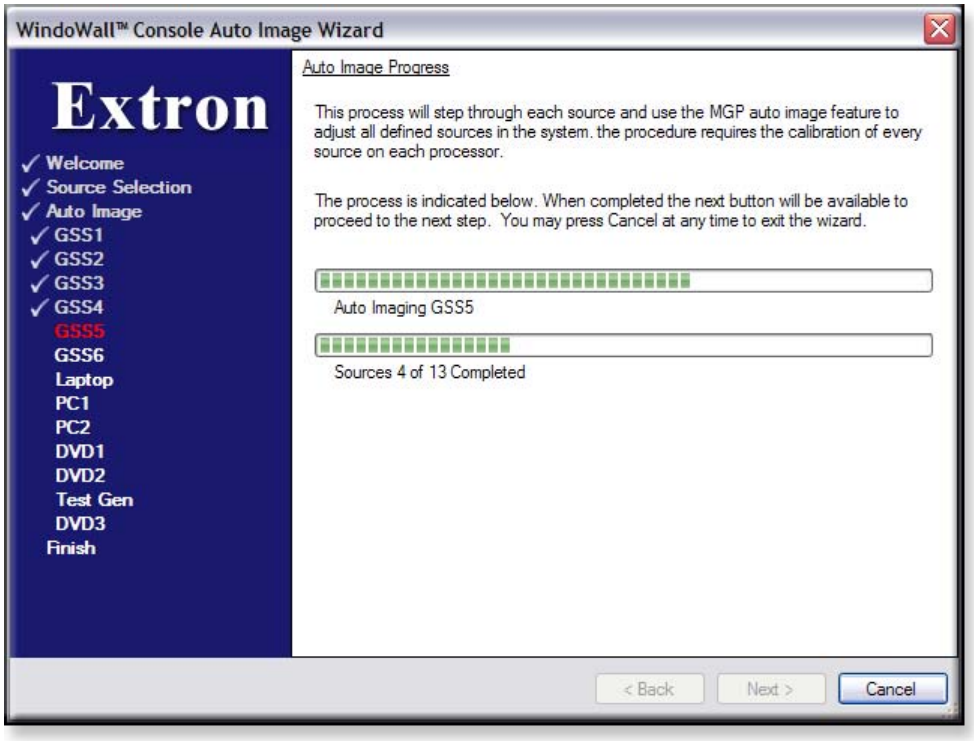
***Source selection screen in the Auto Image Wizard***

4. By default, the **Select All Sources** check box at the top of the screen is selected; therefore, the check boxes for all the input icons are also selected. Clear the check box above the icon for any source that you do not want to be auto imaged.

5. Click **Next**. The software performs auto imaging on each selected source. While auto imaging is in progress, the Auto Image Progress screen is displayed (see the illustration on the next page). This screen contains two progress bars:

   - The top bar shows the auto imaging progress for the source currently being processed.
   - The second bar shows the auto imaging progress for the entire set of sources.

   The left column of the screen contains a list of the inputs being auto imaged. The source currently being processed is shown in red; those completed are preceded by check marks. (See the example on the next page.)


WindoWall™ Console Auto Image Wizard
Extron
✓ Welcome
✓ Source Selection
✓ Auto Image
✓ GSS1
✓ GSS2
✓ GSS3
✓ GSS4
GSS5
GSS6
Laptop
PC1
PC2
DVD1
DVD2
Test Gen
DVD3
Finish
Auto Image Progress
This process will step through each source and use the MGP auto image feature to adjust all defined sources in the system. the procedure requires the calibration of every source on each processor.
The process is indicated below. When completed the next button will be available to proceed to the next step. You may press Cancel at any time to exit the wizard.
Auto Imaging GSS5
Sources 4 of 13 Completed
< Back
Next >
Cancel

6. When all auto imaging has been completed, a "Congratulations" screen appears. Click **Done** to close the Wizard and return to the Canvas screen on the WindoWall Console.
7. You can now drag and drop sources onto the canvas, size and position the windows, and save the layouts as presets. If you want to edit your input sources, select the Source Adjustments tab.

For information on using the WindoWall Console features, select **Contents** from the Help menu to display the WindoWall Console help file.

## Setting Up RS-232/422 Communication

The MGP 464W has a serial communication port that is accessed via a 9-pin female D-sub connector on the rear panel. This port is used to connect to a host or external controlling device, such as a computer or control system, which can generate the proper command codes and recognize the processor's responses.

There are several programs that enable you to connect the MGP 464W to a computer or control device via the RS-232/422 interface, and to enter commands. HyperTerminal for Windows is one such program that is commonly used on PCs. (See the MGP 464W WindoWall Console software's help for information on how to configure the MGP using the WindoWall software.)

For any program that you use, set up communication using the following protocol:

Baud rate: 9600
Data bits: 8
Stop Bits: 1
Parity: None
Flow Control: None

# Using Simple Instruction Set (SIS™) Commands

## Host-to-MGP communications

The MGP 464W accepts SIS (Simple Instruction Set) commands through the RS-232/422 port on the rear panel, or via the Internet. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each response to an SIS command ends with a carriage return and a line feed (↵), which signals the end of the response character string. A string is one or more characters.

## MGP-initiated messages

When a local event such as an input selection or adjustment takes place, the MGP 464W responds by sending a message to the host. No response is required from the host. Examples of MGP-initiated messages are listed below (underlined).

(c) Copyright 2008 Extron Electronics, MGP464, Vx.xx 60-771-xx

The MGP 464W sends the copyright message when it is first powered on. Vx.xx is the firmware version number, and 60-771-11 and 60-771-12 are the part numbers for MGP 464W or MGP 464W DI, respectively.

Www, DD Mmm 2008 hh:mm:ss

The current date and time are displayed following the copyright message at power-up if the connection is via the Internet. (Www are the first three letters of the day of the week; e.g., Mon, Fri.)

Reconfig
Reconfig
Reconfig
Reconfig

The MGP sends a Reconfig message as each of the windows is configured via the new connection.

Out *n* In *nn* (where Out *n* is the window number, and In *nn* is the input number).

The MGP sends this response when an input is switched.

## Error responses

When the MGP 464W receives a valid SIS command, it executes the command and sends a response to the host device. If the processor is unable to execute the command because the command is invalid or contains invalid parameters, it returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (too large)

E09 — Invalid function number (too large)

E10 — Invalid command

E11 — Invalid preset number

E12 — Invalid output number (applies for addressing windows)

E13 — Invalid value (out of range)

E14 — Not valid for this configuration

E17 — Invalid command for signal type

E24 — Privilege violation

E26 — Maximum number of users connected has been exceeded

E27 — Invalid event number

E28 — Bad filename/File not found

## Telnet and Web communications

The MGP 464W can also be controlled via an IP connection using either Telnet (port 23) or a Web browser (port 80). The ASCII and URL commands listed in the tables later in this chapter perform the same functions, but they are encoded differently to accommodate the requirements of each port (Telnet or browser).

The ASCII to hexadecimal (hex) character conversion table below is for use with the Command/response table for SIS commands, beginning on page 3-24.

| ASCII to HEX Conversion Table | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2Ø | ! | 21 | " | 22 | # | 23 | $ | 24 | % | 25 | & | 26 | ' | 27 |
| ( | 28 | ) | 29 | * | 2A | + | 2B | , | 2C | - | 2D | . | 2E | / | 2F |
| Ø | 3Ø | 1 | 31 | 2 | 32 | 3 | 33 | 4 | 34 | 5 | 35 | 6 | 36 | 7 | 37 |
| 8 | 38 | 9 | 39 | : | 3A | ; | 3B | < | 3C | = | 3D | > | 3E | ? | 3F |
| @ | 4Ø | A | 41 | B | 42 | C | 43 | D | 44 | E | 45 | F | 46 | G | 47 |
| H | 48 | I | 49 | J | 4A | K | 4B | L | 4C | M | 4D | N | 4E | O | 4F |
| P | 5Ø | Q | 51 | R | 52 | S | 53 | T | 54 | U | 55 | V | 56 | W | 57 |
| X | 58 | Y | 59 | Z | 5A | [ | 5B | \ | 5C | ] | 5D | ^ | 5E | _ | 5F |
| ` | 6Ø | a | 61 | b | 62 | c | 63 | d | 64 | e | 65 | f | 66 | g | 67 |
| h | 68 | i | 69 | j | 6A | k | 6B | l | 6C | m | 6D | n | 6E | o | 6F |
| p | 7Ø | q | 71 | r | 72 | s | 73 | t | 74 | u | 75 | v | 76 | w | 77 |
| x | 78 | y | 79 | z | 7A | { | 7B | \| | 7C | } | 7D | ~ | 7E | DEL | 7F |

| Esc | 1B |
|---|---|
| CR | ØD |
| LF | ØA |

The command/response tables list valid ASCII (for Telnet) command codes, the corresponding URL encoded command codes (for Web browsers), the processor's responses to the host, and a description of the command's function or results from executing the command.

- Upper- and lowercase letters may be used interchangeably in the command field unless otherwise specified.
- Commands may be sent back-to-back without spaces; for example, 2*2!2*0B.
- Numbers can be entered as 1, 2, or 3 digits; for example, 8V = 08V = 008V.
- There are a few differences in how to enter the commands, depending on whether you are using Telnet or a Web browser.
- For control via a Web browser, all non-alphanumeric characters must be represented as the hexadecimal equivalent, %xx, where xx represents the two-character hex byte. For example, a comma (,) would be represented as %2C.
- When using these commands through a Web browser, the URL reference is used to shorten the examples. "URL" refers to the full URL of the control interface and Web page reference, including all path information; for example, http://192.168.100.10/myform.htm.
- Some characters differ depending on what method you use to send the commands:

| Telnet | Web browser |
|---|---|
| Escape (hex 1B) | W [must not be encoded] |
| Carriage return (hex 0D) | Pipe character (\|) [must not be encoded] |

**NOTE** *With Telnet you can use either the "Escape" commands or the "W" commands, and either the carriage return character or the pipe character. With the Web browser, you are required to use the "W" commands and the pipe character.*

In either method, the data string (shown in braces as {data} in the Command/response table) is directed to the specified port, and must be encoded if it is non-alphanumeric.

## Symbol definitions

↵ = CR/LF (carriage return/line feed) (hex 0D 0A)

← = Carriage return (no line feed, hex 0D)
(use the pipe character, | , instead for Web browser commands)

• = Space character

| = Pipe (vertical bar) character

Esc = Escape key (hex 1B)
(use **W** instead of Esc for Web browsers)

[24, 28] = Superscripts indicate the error message displayed if the command is entered incorrectly or with invalid parameters. See "Error responses, earlier in this chapter."

X1 = Specific port number (01-99)
The port number is represented as two ASCII characters (2 bytes). For example, port 05 would be represented as 30 35 in hexadecimal.

X2 = Command data section

**NOTE** *For Web encoding only:*

*Data is directed to the specified port and must be encoded if it is non-alphanumeric. Because data can include either command terminator, it must be encoded as follows when used within the data section:*

***Space** (Hex 20) must be encoded as %20 (Hex:25 32 30)*

***Plus sign** (Hex 2B) must be encoded as %2B (Hex 25 32 42).*

X3 = Greenwich Mean Time (GMT) offset value (-12:00 to 14:00) in hours and minutes (*hh*:*mm*)

X5 = On/Off
0 = off/disable
1 = on/enable

X11 = Version number (listed to two decimal places)

X12 = Unit name is a text string of up to 24 characters drawn from the alphabet (A-Z), digits (0-9), and the minus sign/hyphen (-). The first character must be an alpha character. The last character must not be a minus. No blank or space characters are permitted, and no distinction is made between upper- and lowercase.

X13 = Local date and time format

**Set** format (MM/DD/YY-HH:MM:SS); e.g., 06/21/02-10:54:00

**Read** format (day of week, date month year) (HH:MM:SS); e.g., Thu, 20 Feb 2003 18:19:33

X14 = IP address (xxx.xxx.xxx.xxx); leading zeros in each of 4 fields are optional in setting values, and are suppressed in returned values.

X15 = Mail domain name (e.g., Extron.com)

X17 = Time in tens of milliseconds (to wait for response via serial port)
Default = 10 [100 ms]
Maximum = 32767

X18 = Hardware (MAC) address (xx-xx-xx-xx-xx-xx)

X19 = Subnet mask (xxx.xxx.xxx.xxx). Leading zeros are optional in setting values in each of four fields, and are suppressed in returned values.

X20 = Time in tens of milliseconds (to wait between characters received via serial port)
Default = 20 [200 ms]
Maximum = 32767

X21 = Message length, delimiter value, or byte count (via serial port)
#L = Length of message to be received
#D = Delimiter value
# = byte count (1 - 32767; default = 0)

X22 = Verbose response mode
0 = clear/none
1 = verbose mode
2 = tagged responses for queries
3 = verbose mode and tagged responses for queries
Default = 0 for Telnet connections;
1 for RS-232/422 control.

**NOTE** *If tagged responses is enabled, all read commands return the constant string plus the data.*

**Example:**
Command: Esc CN ←
Response: Ipn • X12 ↵

X23 = Priority status for receiving port timeouts.
(Response includes leading zeros.)
0 = Use *Send data string* command parameters
1 = Use *Configure receive timeout* command parameters.

X25 = Baud rate: 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, 14400, 19200, 28800, 38400, 57600, or 115200

X26 = Parity (only the first letter is needed):
**O**dd
**E**ven
**N**one
**M**ark
**S**pace

X27 = Data bits: 7, 8

X28 = Stop bits: 1, 2

X29 = Port type
0 = RS-232
1 = RS-422

X30 = Flow control
H = hardware
S = software
N = none

X31 = Data pacing (0000-0001 ms between bytes)
Default = 0 ms

X33 = Password (12 characters = maximum length; no special characters are allowed.)

**NOTE** *A user password cannot be assigned if no administrator password exists; the E14 error code is returned. If the administrator password is cleared, the user password is also removed.*

X34 = Daylight savings time (used in the northern hemisphere [USA] and parts of Europe and Brazil)
0 = off/ignore
1 = on

X35 = Event number, range = 0 - 99

X41 = Reading password. RS-232/422 connection responds with the password. The IP connection responds with 4 asterisks (****) if a password exists, and with an empty space if none exists, instead of with an actual password.

X49 = Default name: a combination of the model-name and the last 3 character pairs of the unit's MAC address
(e.g., MGP-464-00-02-3D)

X51 = Extended security (password) levels: 1-10
The response is returned as two digits with a leading zero.

X52 = Connection's security level
0 = anonymous
1-10 = extended security level
11 = user
12 = administrator

X66 = Login without password is allowed. If enabled, the user does not enter a password. After the user clicks **OK**, the login level is set based on the setting in the X68 parameter.
0 = disabled
1 = enabled

X68 = No-password login level
1-11 = Entry without password goes to the level specified if an administrator password exists.
0 = Entry without password is placed one level below the lowest password level (0-11).
The response is returned as two digits with a leading zero if needed.

X69 = Number of seconds (in tens of seconds) before timeout on IP connections

X500 = Input number 0 through 4

X503 = Input video format
1 = RGB
2 = YUV-HD
3 = RGBcVs
4 = YUVi
5 = S-video
6 = Composite
7 = DVI

X504 = Test pattern
0 = Off
1 = Color Bars
2 = Crosshatch
3 = 4 x 4 crosshatch
4 = Grayscale
5 = Ramp
6 = Alternating pixels
7 = White field
8 = Crop
9 = Side-by-side crop
10 = 4 x 4 quad split
11 = 4 x 3 PIP column
12 = 4 x 3/16 x 9 film aspect ratio 1.78
13 = 4 x 3/16 x 9 film aspect ratio 1.85
14 = 4 x 3/16 x 9 film aspect ratio 2.35

X508 = Scaler resolution
1 = 640 x 480
2 = 800 x 600
3 = 852 x 480
4 = 1024 x 768
5 = 1024 x 852
6 = 1024 x 1024
7 = 1280 x 768
8 = 1280 x 1024
9 = 1360 x 765
10 = 1365 x 768
11 = 1366 x 768
12 = 1365 x 1024
13 = 1400 x 1050
14 = 1600 x 1200
15 = 480p
16 = 576p
17 = 720p
18 = 1080i
19 = 1080p
20 = DVI background input resolution

X509 = Detected input signal standard
0 = None
1 = NTSC
2 = PAL
4 = SECAM
- = Not applicable (occurs when the input is set for DVI, RGB, or YUV)

X513 = Window preset (1-100)

X515 = Scaler refresh rate
1 = 50 Hz
2 = 60 Hz
3 = 72 Hz
4 = 96 Hz
5 = 100 Hz
6 = 120 Hz
7 = DVI background input refresh rate

X519 = Internal temperature in degrees Fahrenheit

## Command/response table for SIS commands

| Command | ASCII (Telnet) (host to switcher) | Response (switcher to host) | Additional description |
|---|---|---|---|
| **DVI Input EDID/DDC** | | | |
| Set EDID information | 41 * X508 * X515 # | DDC X508 * X515 ↵ | Set the DVI input EDID resolution to X508 and the refresh rate to X515. |
| View EDID information | 41# | X508 * X515 ↵ | View the DVI input EDID resolution and refresh rate. |
| **NOTE** *Default state is to match the output resolution.* X508 *= 0;* X515 *= 0* | | | |
| **Output scaler rate** | | | |
| Set output resolution and scan rate | X508 * X515 = | Rte X508 * X515 ↵ | Select a scaler output resolution and scan rate. |
| View output rate settings | = | X508 * X515 ↵ | View the current output's resolution and scan rate settings. |
| View output rate details | 0 = | *width * height * refresh rate* ↵ | View the current output's size and refresh rate. |
| **NOTE** *The output rate detail command is able to display the actual resolution of the output when the MGP is configured to use the DVI background rate.* | | | |
| Output polarity | 1 * X! # | Pol X! ↵ | Set output polarity. X! is:<br>0 = H-/V- (default)<br>1 = H-/V+<br>2 = H+/V-<br>3 = H+/V+ |
| *Example:* | 1 * 2 # | Pol 2 ↵ | H+/V– sync polarity |
| View output polarity | 1 # | X! ↵ | View the current output polarity setting. |
| Output sync format | 2 * X! # | Syn X! ↵ | Set the output sync format. X! is:<br>1 = RGBHV<br>2 = RGBS<br>3 = RGsB<br>4 = YUV bi-level<br>5 = YUV tri-level |
| View output sync format | 2 # | X! ↵ | View the current output sync format setting. |
| **Test pattern** | | | |
| Set test pattern | X504 J/j | Tst X504 ↵ | Select a test pattern. |
| View test pattern | J/j | X504 ↵ | View the currently selected test pattern. |
| Blue mode | 3 * X5 # | Blu X5 ↵ | Turn blue mode on and off. |
| View blue mode status | 3 # | X5 ↵ | View the current blue mode status. |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Bi-directional serial data port** | | | | |
| Send data string | Esc X1 * X17 * X20 * X21 RS ← X2 | W X1 %2A X1 % %2A X20 %2A X21 RS \| X2 | *Response from command* ↵ | |
| **NOTE** X1 = *Port number (01-99).* | | | | |
| | X17 = *Time in tens of milliseconds that the MGP will wait until receipt of the first response character before terminating the command. (Default = 10 = 100 ms; max. = 32767.)* | | | |
| | X20 = *Time in tens of milliseconds that the MGP will wait between characters being received via a serial port before terminating the current command or receive operation. (Default = 20 = 200 ms; max. = 32767.)* | | | |
| | X21 = *#L or #D. The letter parameter is case sensitive (requires capital D or capital L).*<br>*L = **L**ength of the message to be received.*<br>*D = **D**elimiter value.*<br>*# = Byte count (for L) or a single ASCII character expressed in decimal form (for D).*<br>*Byte count # can be 0 - 32767; default = 0. The ASCII decimal # can be 0 - 00255; default = the byte count.*<br>***Examples:** A 3-byte length = 3L; a delimiter of ASCII 0A = 10D.*<br>*The response includes leading zeros.* | | | |
| | X2 = *Command data section. For Web encoding, be sure to convert non-alphanumeric characters to hex numbers for* X2. | | | |
| *Example:* | Esc 05 * 4 * 7 * 3L RS ← *<data>* 8 | W05 %2A 4 %2A 7 %2A 3L RS \| *<data>* | *Response from command* ↵ | |
| **NOTE** *The* * X17 * X20 * X21 *sequence is optional. If* X17 *and* X20 *are not specified, the default values are used.* | | | | |
| Configure serial port parameters[24] | Esc X1 * X25 , X26 , X27 , X28 CP ← | W X1 %2A X25 %2A X26 %2A X27 %2A X28 CP \| | Cpn X1 • **Ccp** X25 , X26 , X27 , X28 CP ↵ | Set baud rate X25, parity X26, data bits X27, and stop bits X28 for port X1. |
| View serial port parameters | Esc X1 CP ← | W X1 CP \| | X25 , X26 , X27 , X28 CP ↵ | |
| Configure mode[24] | Esc X1 * X29 CY ← | W X1 %2A X29 CY \| | Cpn X1 • Cty X29 ↵ | X29 = port type.<br>0 = RS-232<br>1 = RS-422 |
| View mode | Esc X1 CP ← | W X1 CY \| | X29 ↵ | |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Bi-directional serial data port (continued)** | | | | |
| Configure flow control[24] | Esc X1 * X30 , X31 CF ← | W X1 %02A X30 %02C X31 CF \| | Cpn X1 • Cfl X30 , X31 ↵ | X30 = Flow control.<br>H = Hardware.<br>S = Software.<br>N = None (default).<br>X31 = Data pacing (specified in milliseconds between bytes. X31 can be 0000-0001; default = 0 ms. |
| View flow control | Esc X1 CF ← | W X1 CF \| | X30 , X31 ↵ | |
| Configure receive timeout[24] | Esc X1 * X17 * X20 * X23 * X21 CE ← | W X1 %2A X17 %2A X20 %2A X23 %2A X21 CE \| | Cpn X1 • Cce X17 , X20 , X23 , X21 CE ↵ | Set the time that the MGP will wait for a response before terminating the command.<br>X17 = Waiting time in tens of ms until receipt of the first response character.<br>X20 = Waiting time in tens of ms between characters.<br>X23 = Priority Status for port X1 receiving timeouts.<br>0 = Use *Send data string* command parameters (default).<br>1 = Use *Configure receive timeout* command parameters.<br>Response includes leading zeros. |
| View receive timeout | Esc X1 CE ← | W X1 CE \| | X17 , X20 , X23 , X21 ↵ | |
| **Ethernet data port** | | | | |
| Set current connection port timeout | Esc 0 * X69 TC ← | W 0 %2A X69 TC \| | Pti 0 * X69 ↵ | X69 = Number of seconds (in tens of seconds) before timeout on IP connections. |
| View current connection port timeout | Esc 0TC ← | W 0TC \| | X69 ↵ | |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Ethernet data port (continued)** | | | | |
| Set global IP port timeout | Esc 1 * X69 TC ← | W 1 %2A X69 TC \| | Pti 1 * X69 ↵ | |
| View global port timeout | Esc 1TC ← | W 1TC \| | X69 ↵ | X69 = Number of seconds (in tens of seconds) before timeout on IP connections. |
| **NOTE** *An asterisk (*) after the version number indicates which version is currently running. A caret (^) indicates bad checksum/invalid load. Question marks (?.??) indicate that the firmware version is not loaded.* | | | | |
| **Firmware version requests** | | | | |
| Query firmware version | Q or 1Q | Q or 1Q | X11 ↵ | Show the processor's firmware version number (X11) to two decimal places. Gives the number of the currently running version of the user-updatable firmware. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Ver01 * X11 ↵ | |
| Query bootstrap version | 2Q | 2Q | X11 ↵ | The bootstrap firmware is not user-replaceable, but you may need this information for troubleshooting. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Ver02 * X11 ↵ | |
| Query factory firmware version | 3Q | 3Q | X11 (plus web ver.-desc-UL date/time) ↵ | Factory-installed firmware is not user-replaceable. This firmware was installed at the factory; it is the version the processor reverts to after a mode 1 reset (see chapter 3). |
| | | | ***With tagged response – verbose modes 2 and 3:*** Ver03 * X11 (plus web ver.-desc-UL date/time) ↵ | |
| *Example:* | 3Q | 3Q | 1.00(1.07-MGP464Series-Wed, 16 Jan 2006 03:28:10 GMT) | In this example, the factory firmware version is 1.00, also known as the kernel version 1.07, for the MGP 464W, dated 16 January, 2006. |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Firmware version requests (continued)** | | | | |
| Query updated firmware version | 4Q | 4Q | X11 (plus web ver.-desc-UL date/time) ↵ | Find out which firmware version, if any, was uploaded into the unit after it left the factory. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Ver04 * X11 (plus web ver.-desc-UL date/time) ↵ | |
| *Example:* | 4Q | 4Q | 1.01 * (1.22-MGP464 Series-Mon. 14 Jan 2008 17:03:46 | Factory firmware version is 1.01, or kernel version 1.22, for MGP 464W, dated 14 January, 2008, at 5:03:46 p.m. |
| Query verbose version information | 0Q | 0Q | Sum of responses from 2Q-3Q-=4Q ↵ | Show bootstrap, factory-installed, and updated firmware versions. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Ver00 * Sum of responses from 2Q-3Q-4Q ↵ | |
| *Example:* | 0Q | 0Q | 1.01 | |
| **Information requests** | | | | |
| General information | X502 * I | X502 %2A I | Chn X500 • Typ X503 • Std X509 • Blk X5 ↵ | View input number, video signal type, input signal standard, and blanking (muting) status in window X502. |
| View internal temperature | 20S | 20S | X519 ↵ | View internal temperature in degrees Fahrenheit. |
| Request unit part number | N | N | 60-771-01 *or* 60-771-02 ↵ | Show unit part number. MGP 464W is 60-771-01; MGP 464W DI is 60-771-02. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Pno 60-771-01/60-771-02 ↵ | |
| Request model name | 1I | 1I | MGP 464W *or* MGP 464W DI ↵ | Show unit model name. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Inf01 * MGP 464W *or* Inf01 * MGP 464W DI | |
| Request model description | 2I | 2I | Four Window Multi-Graphic Processor ↵ | Show type of unit. |
| | | | ***With tagged response – verbose modes 2 and 3:*** Inf02 * Four Window Multi-Graphic Processor | |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Information requests (continued)** | | | | |
| Request system memory usage | 3I | 3I | *n* bytes used out of *n* kBytes ↵<br>***With tagged response – verbose modes 2 and 3:***<br>Inf03 * *n* bytes used out of *n* kBytes ↵ | Show amount of memory used and total available memory for system operations. |
| Request user memory usage | 4I | 4I | *n* bytes used out of *n* kBytes ↵<br>***With tagged response – verbose modes 2 and 3:***<br>Inf04 * *n* bytes used out of *n* kBytes ↵ | Show amount of user memory used and total available user memory. |
| **IP setup commands** | | | | |
| Set unit name[24] | Esc X12 CN ← | W X12 CN \| | Ipn • X12 ↵ | Change the processor's name to one of your choosing (X12). The name consists of up to 24 alphanumeric characters (and the minus sign/hyphen). The first character must be a letter, the last character cannot be a minus sign. Case does not matter. |
| Set unit name to factory default[24] | Esc • CN ← | W %20 CN \| | Ipn • X49 ↵ | X49 is the name the processor was shipped with: MGP464-##-##-##, a combination of the model name and the last three pairs of the hex numbers in the unit's MAC address (e.g., MGP464-00-02-3d). |
| Read unit name | Esc CN ← | W CN \| | X12 ↵ | X12 is the processor's current name. X49 is its factory default name. |
| Set time/date[24] | Esc X13 CT ← | W X13 CT \| | Ipt • X13 ↵ | X13 is the local date and time format. The **set** format is MM/DD/YY-HH:MM:SS.<br>*Example: 11/13/06-10:54:00* |
| Read time/date | Esc CT ← | W CT \| | X13 ↵ | The read format is *day of week*, DD *month year* HH:MM:SS.<br>*Example: Tue, 18 Nov 2006 18:19:33* |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **IP setup commands (continued)** | | | | |
| Set GMT offset[24] | Esc X3 CZ ← | W X3 CZ \| | Ipz X3 ↵ | Set the Greenwich Mean Time (GMT) offset value (X#) for the processor's location. GMT offset (-12.00 to +14.00) represents the time difference in hours and minutes (± hh:mm relative to Greenwich, England). The plus sign and leading zero are optional. *Example: 5:30 = +05:30* |
| Read GMT offset | CZ ← | W CZ \| | X3 ↵ | |
| Set daylight savings time[24] | Esc X34 CX \| ← | W X34 CX \| | Ipx X34 ↵ | X34 is the daylight savings time of day. Daylight savings time (DST) is a one-hour offset that is observed in the USA and parts of Europe and Brazil. For example, California uses GMT -8:00 from April to October and -7:00 GMT from November to March. DST should be turned off in Hawaii, American Samoa, Guam, Puerto Rico, the U.S. Virgin Islands, the eastern time zone part of Indiana, and Arizona (excluding the Navajo Nation). 0 = Off/ignore; 1 = On. |
| Read daylight savings time | Esc CX ← | W CX \| | X34 ↵ | |
| Set DHCP on[24] | Esc 1DH ← | W 1DH \| | Idh1 ↵ | |
| Set DHCP off[24] | Esc 0DH ← | W 0DH \| | Idh0 ↵ | |
| View DHCP mode | Esc DH ← | W DH \| | Idh X5 ↵ | X5 = 0 (off) or 1 (on). |
| Set IP address[24] | Esc X14 CI ← | W X14 CI \| | Ipi • X14 ↵ | X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros in each of the four fields are optional in setting values. |
| Read IP address[24] | Esc CI ← | W CI \| | X14 ↵ | Leading zeros in each of the four fields are suppressed in returned values. |
| Read hardware address (MAC) | Esc CH ← | W CH \| | X18 ↵ | X18 = hardware media access control (MAC) address (xx-xx-xx-xx-xx-xx). |
| Set subnet mask[24] | Esc X19 CS ← | W X19 CS \| | Ips • X19 ↵ | X19 = subnet mask (xxx.xxx.xxx.xxx). Syntax is the same as for IP addresses. Leading zeros are optional in setting values. |
| Read subnet mask | Esc CS ← | W CS \| | X19 ↵ | Leading zeros are suppressed. |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **IP setup commands (continued)** | | | | |
| Set gateway address[24] | Esc X14 CG ← | W X14 CG \| | Ipg • X14 ↵ | X14 = IP address (xxx.xxx.xxx.xxx). Leading zeros are optional. |
| Read gateway address | Esc CG ← | W CG \| | X14 ↵ | |
| Set administrator password | Esc X33 CA ← | W X33 CA \| | Ipa • X41 ↵ | Set the administrator access password. (X33 is 4-12 alphanumeric characters.) The password is case sensitive. Special characters (spaces or symbols) are not allowed. |
| View administrator password | Esc CA ← | W CA \| | X41 ↵ | View password level X41, shown with leading zeros. |
| Set user password[14 24] | Esc X33 CU } ← | W X33 CU \| | Ipu • X41 ↵ | Set the user password. (X33 is 4-12 alphanumeric characters.) The password is case sensitive. Special characters (spaces or symbols) are not allowed. |
| **NOTE** *A user password cannot be assigned if an administrator password does not exist.* | | | | |
| Clear user password[24] | Esc • CU ← | W %20 CU \| | Ipu • ↵ | Clear the user password only. |
| View user password | Esc CU ← | W CU \| | X41 ↵ | View password level X41, shown with leading zeros. |
| Set extended level password[24] | Esc X51 , X33 CO ← | W X51 2%C X33 CO \| | Ipo X51 • X41 ↵ | Set password X33 for security level X51. X51 is 1-10. |
| Clear extended level password[24] | Esc X51 , CO ← | W X51 2%C CO \| | Ipo X51 • ↵ | Remove password from security level X51. |
| View extended level password | Esc X51 CO ← | W X51 CO \| | X41 ↵ | View password level X41, shown with leading zeros. |
| Set read-only security level support[24] | Esc X66 * X68 EP ← | W X66 %2A X68 EP \| | Pvo X66 * X68 ↵ | Enable no-password login at security level X68. X68 is 1-11.<br>0 = Disabled.<br>1 = Enabled. |
| View read-only security level support[24] | Esc EP ← | W EP \| | X66 * X68 ↵ | View status and level of no-password security. |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **IP setup commands (continued)** | | | | |
| Query session security level | Esc CK ← | W CK \| | X52 ↵ | View the security level of the current connection. X52 is:<br>0 = Anonymous<br>1-10 = Extended security level<br>11 = User<br>12 = Administrator<br>***With tagged response – verbose modes 2 and 3:***<br>Pvl X52 ↵ |
| Set Verbose mode[24] | Esc X22 CV ← | W X22 CV \| | X22 ↵ | Enable or disable verbose mode. |
| **NOTE** *The processor can be set to send out unsolicited information (such as notice of a change in volume, input, or some other setting). This is called a* verbose *(wordy) relationship between the processor and a connected device. For a direct RS-232/422 connection, the processor is set for verbose mode by default. When the MGP 464W is connected via Ethernet, verbose mode is disabled by default in order to reduce the amount of communication traffic on the network. If you want to use the verbose mode with a processor connected via Ethernet, you must set this mode to On each time you reconnect to the processor.* | | | | |
| Read verbose mode | Esc CV ← | W CV \| | X5 ↵ | |
| Read connection's security level | Esc CK ← | W CK \| | X52 ↵ | For X52:<br>0 = Anonymous.<br>1–10 = Extended security levels 1 through 10.<br>11 = User.<br>12 = Administrator.<br>***With tagged response – verbose modes 2 and 3:***<br>Pvl X52 ↵ |
| **Re-map port designations** | | | | |
| Set Telnet port map[24] | Esc {*port#*} MT ← | W {*port#*} MT \| | Pmt {port#} ↵ | |
| Reset Telnet port map[24] | Esc 23MT ← | W 23MT \| | Pmt 00023 ↵ | |
| Disable Telnet port map[24] | Esc 0MT ← | W 0MT \| | Pmt 00000 ↵ | |
| Read Telnet port map | Esc MT ← | W MT \| | {*port#*} ↵ | |
| Set Web port map[24] | Esc {*port#*} MH ← | W {*port#*} MH \| | Pmh {*port#*} ↵ | |
| Reset Web port map[24] | Esc 80MH ← | W 80MH \| | Pmh 00080 ↵ | |
| Disable Web port map[24] | Esc 0MH ← | W 0MH \| | Pmh 00000 ↵ | |
| Read Web port map[24] | Esc MH ← | W MH \| | {*port#*} ↵ | |
| Set Direct Access port map[24] | Esc {*port#*} MD ← | W {*port#*} MD \| | Pmd {*port#*} ↵ | |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Re-map port designations (continued)** | | | | |
| Reset Direct Access port map[24] | Esc 2001MD ← | W 2001MD \| | Pmd 02001 ↵ | |
| Disable Direct Access port map[24] | Esc 0MD ← | W 0MD \| | Pmd 00000 ↵ | |
| Read Direct Access port map[24] | Esc MD ← | W MD \| | {*port#*} ↵ | |
| **List connections** | | | | |
| Get connection listing | Esc CC ← | W CC \| | *Number of connections* ↵ | |
| **File commands** | | | | |
| List files from current directory | Esc DF ← | W DF \| | (See below.) | Retrieve a list of files stored in the MGP 464W. |
| List files from current directory and below | Esc LF ← | W LF \| | (See below.) | Each line of the response lists a different file name and its corresponding file size. The last line of the response indicates how much available file space remains. |
| | **Unit Telnet text responses:** | | Unit Web responses (HTML sample code): | |
| | filename x • date/time • length ↵ | | var file – new Array (): | |
| | filename x • date/time • length ↵ | | file [1] = "*filename 1, date 1, filesize 1*"; | |
| | filename x • date/time • length ↵ | | file [1] = "*filename 2, date 2, filesize 2*"; | |
| | filename x • date/time • length ↵ | | file [1] = "*filename 3, date 3, filesize 3*"; | |
| | ... | | ... | |
| | space_remaining • bytes left ↵ ↵ | | file [*n*] = "*filename n, date n, filesize n*"; | |
| | | | file [1] = "*filename n+1, date n+1, filesize n+1*"; | |
| **Directory commands** | | | | |
| Change/create directory | Esc {*path*} / {*directory*}/CJ ← | | | |
| | | W {*path*} / {*directory*}/CJ \| | Dir • {*path*} / {*directory*} / ↵ | |
| **NOTE** *A directory does not actually exist until a file has been copied into the path.* | | | | |
| Move back to root directory | Esc / CJ ← | W %2F CJ \| | Dir • / ↵ | |
| Move up one directory | Esc .. CJ ← | W %2E %2E CJ \| | Dir • {*path*} / {*directory*} / ↵ | |
| View current directory | Esc CJ ← | W CJ \| | {*path*} / {*directory*} / ↵ | |

## Command/response table for SIS commands (continued)

| Command | ASCII (Telnet) (host to processor) | URL Encoded (Web) (host to processor) | Response (Processor to host) | Additional description |
|---|---|---|---|---|
| **Reset (Zap) / Erase commands** | | | | |
| Erase user-supplied Web page/file[24 28] | Esc {*filename*} EF ← | W {*filename*} EF \| | Del • {*filename*} ↵ | |
| Erase current directory and its files[24 28] | Esc / EF ← | W / EF \| | Ddl ↵ | |
| Erase current directory and subdirectories[24 28] | Esc // EF ← | W // EF \| | Ddl ↵ | |
| Erase flash memory | Esc ZFFF ← | W ZFFF \| | Zpf ↵ | |
| Reset all device settings to factory default[24] | Esc ZXXX ← | W ZXXX \| | Zpx ↵ | No IP-related settings are reset. |
| Absolute system reset[24] | Esc ZQQQ ← | W ZQQQ \| | Zpq ↵ | Reset all settings/memories, including all adjustments, the IP address, and the subnet mask, to the factory default values. The IP address is reset to 192.168.254.254, and the subnet mask is set to 255.255.0.0 (identical to reset mode 5). |
| Absolute reset retaining IP[24] | Esc ZY ← | W ZY \| | Zpy ↵ | Same as Absolute system reset (EZQQQ) except that IP settings, including IP address, subnet mask, gateway address, unit name, DHCP setting, and port mapping (Telnet/ Web/Direct Access) are excluded in order to preserve communication with the device (recommended after a firmware update). |

# Chapter Four

# Ethernet-based Configuration and Control

Accessing the Web Pages

Viewing System Status

Using the Configuration Pages

Using the File Management Page

# Ethernet-based Configuration and Control

The MGP 464W processor can be controlled and configured using HTML Web pages accessed over a network or from a local PC connected to the MGP 464W's LAN port. The MGP 464W has factory-installed HTML Web pages that allow you to view system status, set the MGP's IP address, update the firmware, and perform other processor functions. Access these HTML pages using a Web browser such as Microsoft's Internet Explorer.

**NOTE** *Administrators have access to all of the Web pages and are able to make changes to settings. Users can access the* **Status** *tab only.*

## Accessing the Web Pages

To access the MGP 464W's HTML Web pages,

1. Start the Web browser program.
2. Enter the MGP 464W's IP address in the browser's Address field.

**NOTE** *If the MGP has not been given an address by someone at your site, use the factory-specified default,* ***192.168.254.254****, for this field.*

3. If you want the browser to display a page other than the default page (such as a custom page that you have created and uploaded), enter a slash (/) and the name of the file to open.

**NOTE** *The browser's Address field should display the address in the following format:*

**xxx.xxx.xxx.xxx/{optional_file_name.html}**

**NOTE** *The following characters are invalid in file names:*

{**space**} ~ @ = ‘ [ ] { } < > ’ “ ; : | \ and **?**.

4. Press the Enter key. If the MGP 464W's HTML pages are not password protected, the browser displays a start page as described in step **5**.
5. If the MGP 464W's HTML pages are password protected, the browser displays the Enter Network Password dialog box.

***Example of an Enter Network Password dialog box***

Enter the password as follows:

a. Type the administrator or user password in the Password field.

**NOTE** *A User Name entry is not required.*

b. If desired, select the **Remember my password** check box to have the system input your password the next time you enter the MGP's address.

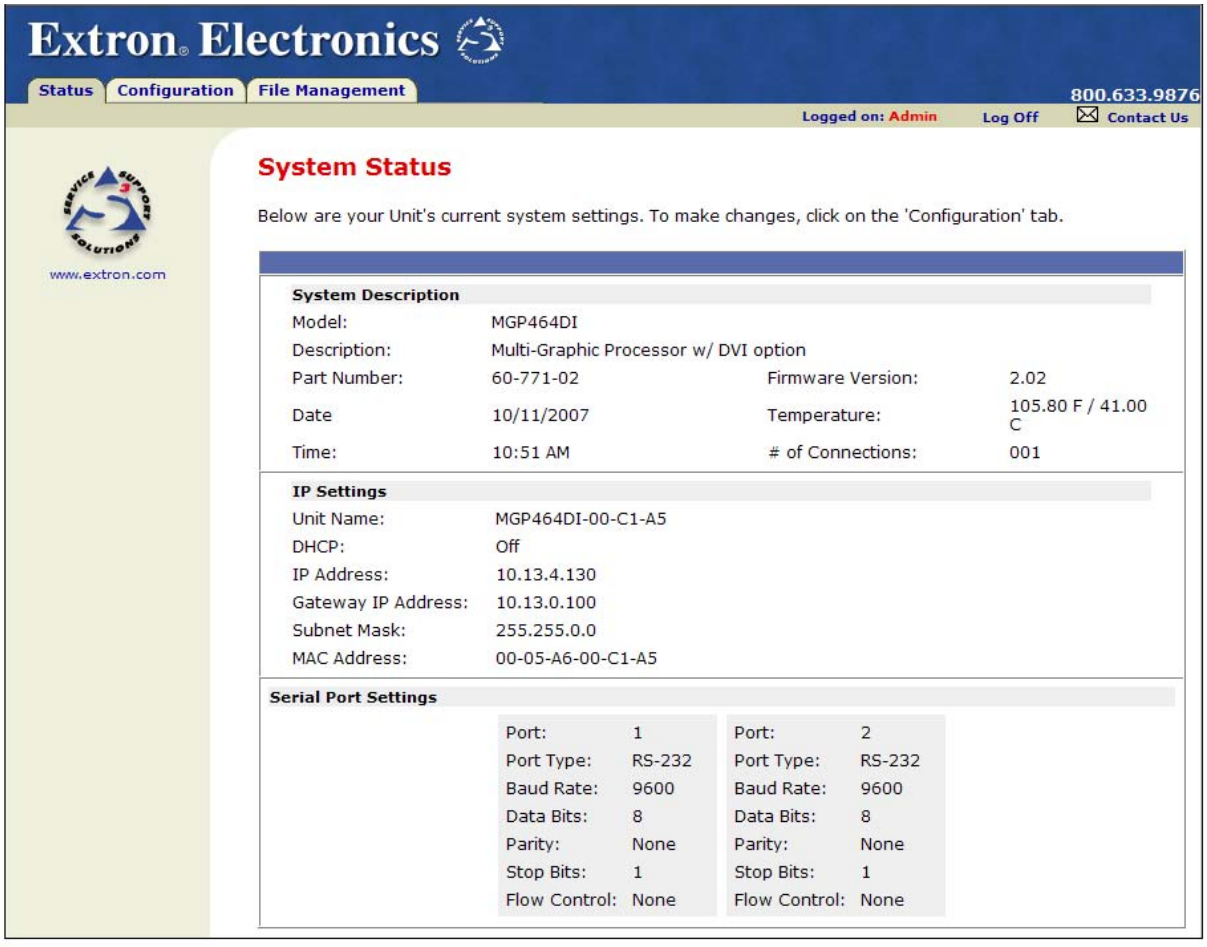
c. Click **OK**.

6. If you entered the filename for a custom HTML page in step **3**, the browser displays that page. If not, the browser displays the System Status page, which is the MGP 464W's default start page. You can select the tabs at the top of this screen to access additional screens that enable you to configure and operate the MGP 464W.

## Viewing System Status

The System Status Web page on the Status tab shows your MGP 464W's current settings. (Changes to these settings can be made via the Configuration Web pages, the WindoWall Console software, or SIS commands.) Personnel who have only user access can view this page but cannot access the Configuration pages; they see only the **Status** tab.

The following figure shows an example of an MGP 464W System Status Web page.




***System Status screen***

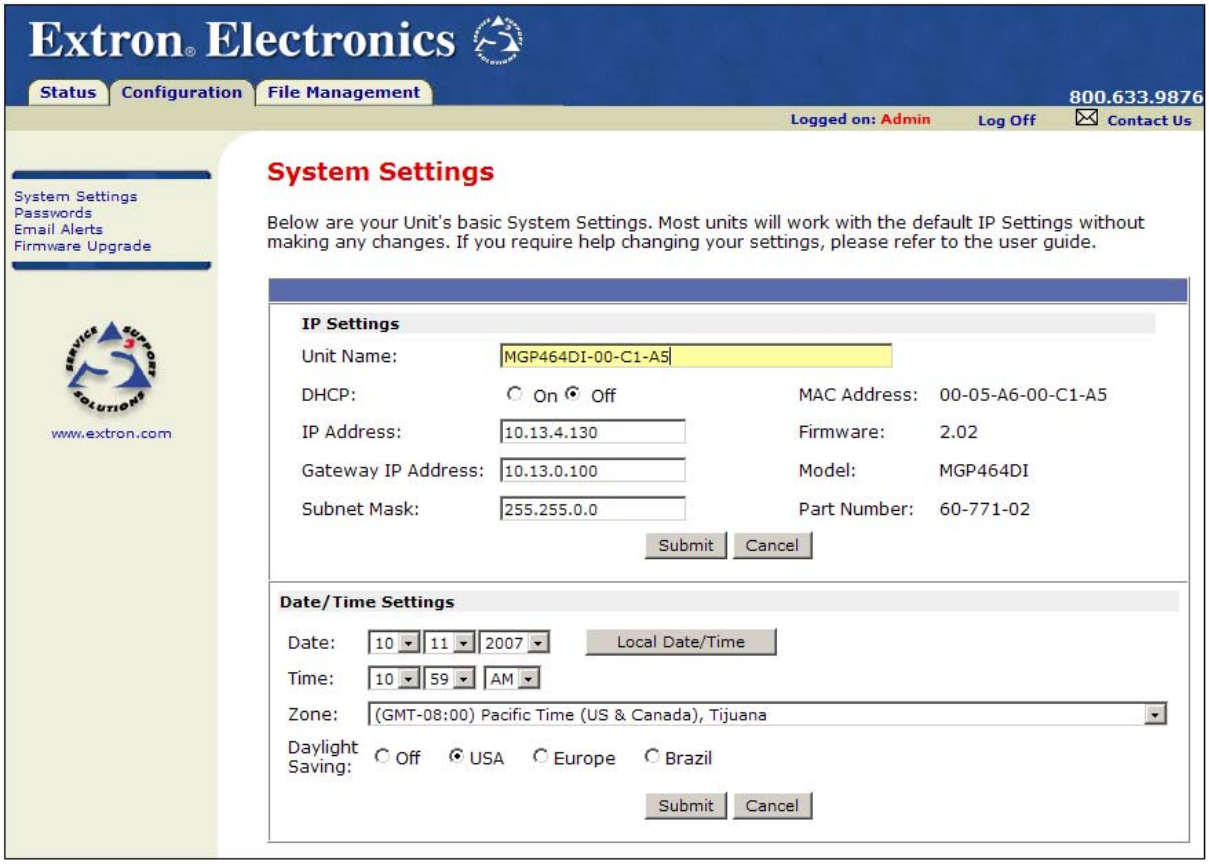
**NOTE** *The Port 2 information displayed in the Serial Port Settings section does not apply to the MGP 464W.*

## Using the Configuration Pages

There are four Configuration Web pages, which only administrators can access. These pages are listed in the sidebar menu at the left of the Configuration screen. The following sections describe the changes you can make from these screens.

### System Settings screen

On the System Settings screen (shown below), you can set date and time parameters and change the IP information for the MGP 464W.




***System Settings screen***

To change your system settings,

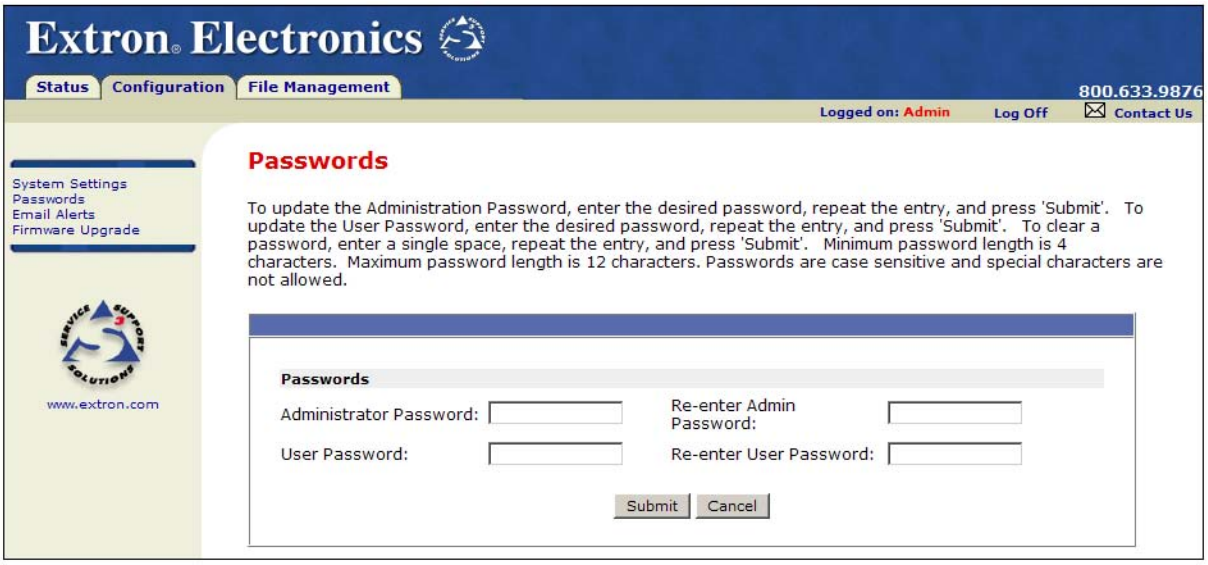
1. Select the **Configuration** tab. The **System Settings** screen is displayed.
2. Select or enter the new information in the desired field(s) in either the IP Settings or the Date/Time Settings section.
3. When you have made all the desired inputs in one section, click the **Submit** button at the bottom of the section. The new settings appear in the fields.
4. Follow steps **2** and **3** to make changes in the other section, if needed.

## Passwords screen

The Passwords screen lets you assign an administrator and/or user password to control access to the MGP 464W Web pages.

**NOTE** *An administrator password must be in place before a user password can be assigned.*

**NOTE** *Passwords must contain 4 to 12 alphanumeric characters. Symbols and spaces are not allowed, and the passwords are case sensitive.*


Extron Electronics
Status
Configuration
File Management
800.633.9876
Logged on: Admin
Log Off
Contact Us
System Settings
Passwords
Email Alerts
Firmware Upgrade
www.extron.com
Passwords
To update the Administration Password, enter the desired password, repeat the entry, and press 'Submit'. To update the User Password, enter the desired password, repeat the entry, and press 'Submit'. To clear a password, enter a single space, repeat the entry, and press 'Submit'. Minimum password length is 4 characters. Maximum password length is 12 characters. Passwords are case sensitive and special characters are not allowed.
Passwords
Administrator Password:
Re-enter Admin Password:
User Password:
Re-enter User Password:
Submit
Cancel

***Passwords screen***

### Assigning a password

To assign passwords,

1. On the **Configuration** tab, click **Passwords** on the left sidebar menu.
2. Enter the new administrator password in the Administrator Password field.
3. In the Re-enter Admin Password field, enter the same password again to confirm it.
4. If you want to assign a user password, enter it in the User Password field.

   **NOTE** *You cannot assign a user password unless an administrator password has been assigned.*

5. Enter the user password again in the Re-enter the User Password field.
6. Click **Submit** to set the password(s).

### Clearing a password

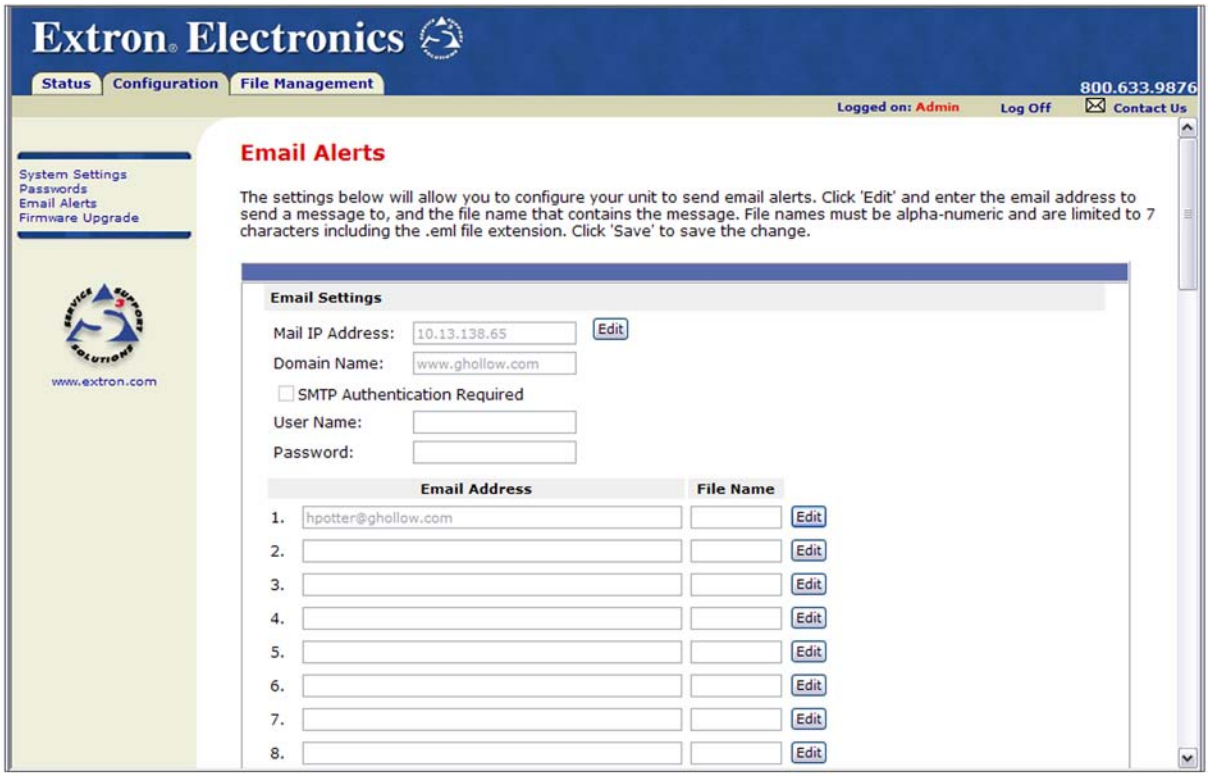
To remove an assigned password,

1. In the Administrator Password or User Password field, enter a single space.
2. Enter a single space in the Re-enter Admin Password or the Re-enter User Password field.
3. Click **Submit**.

## Email Alerts screen

The Email Alerts screen enables you to set up the MGP 464W to automatically send e-mail alert messages when an event occurs on the MGP 464W. You can enter up to 64 e-mail addresses for alert recipients.

You can also specify that SMTP (Simple Mail Transfer Protocol) authorization is needed for the MGP to accept incoming e-mail. This prevents spam from taking up space in the MGP's e-mail system.




***Email Alerts screen (top portion)***

### Setting up e-mail alerts

To set up the system to send e-mail alerts when settings are changed,

1. On the sidebar menu on the **Configuration** tab, click **Email Alerts**.
2. On the Email Alerts screen, click the **Edit** button located to the right of the Mail IP Address and Domain Name fields. The button changes to **Save**.
3. Enter your MGP 464W's IP address and your domain name in the appropriate fields. (This information is available from your network administrator.)
4. If your MGP has password(s) assigned, enter them.
5. Click **Save**.

To set up e-mail addresses for notification, do the following for each recipient of e-mail alerts:

1. Click the **Edit** button at the end of the address row. The **Edit** button changes to **Save**.
2. Enter the e-mail address of the recipient, and the file name on your computer (.eml extension) that contains the message.
3. Click the **Save** button to save the changes. The **Save** button changes back to **Edit**.

### Setting up SMTP authorization

To set the MGP to require SMTP authorization before accepting any e-mail,

1. To enable the SMTP authorization fields, click the **Edit** button at the right of the Mail IP Address field. The **Edit** button changes to **Save**.
2. Select the **SMTP Authorization Required** check box, located below the Domain Name field. This enables the User Name and Password fields below the check box.
3. In the User Name and Password fields, enter a user name and a password that senders must enter for the MGP to accept their e-mail messages.

   For the User name, you can use any combination of letters, numerals, spaces, and symbols **except** the comma (,) and the single and double quotation marks (‘ and “). For the password, you can use all characters except the comma. The user name and password can each be from 1 to 30 characters.

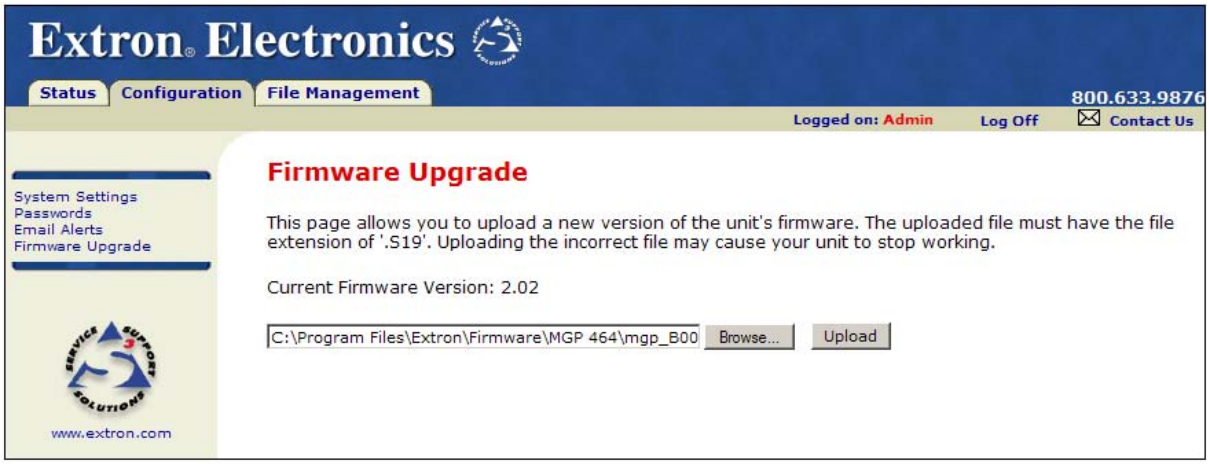
**NOTE** *You must specify **both** a user name and a password.*

4. Click the **Save** button next to the Mail IP Address field to save your user name and password.

To remove SMTP authorization, click **Edit**, deselect the **SMTP Authorization Required** check box, then click **Save**.

## Firmware Upgrade screen

The Firmware Upgrade screen enables you to install a new version of firmware to your MGP 464W. You can download the latest firmware version from the Extron Web site to your PC. Appendix B provides more details on firmware updating.




***Firmware Upgrade screen***

### Determining the current firmware version

There are two methods you can use to find out what firmware version is currently installed on your MGP 464W:

- **Using an SIS command:** Enter a query command (Q). See "Firmware version requests" in the "Command/response table for SIS commands" in chapter 3, "Software-based Configuration and Control," for information on entering SIS commands.
- **Using the System Status Web page:** Select the **Status** tab on the MGP 464W Web page to display the System Status screen. The firmware version is on the third line (to the right of the part number) in the System Description section.

### Downloading the firmware file

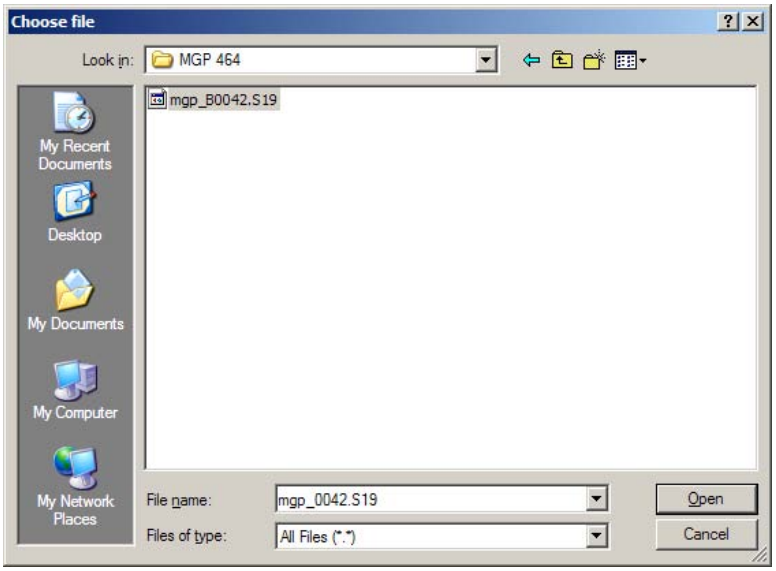
To obtain the latest version of MGP 464W firmware,

1. Visit the Extron Web site (www.extron.com) and click the **Download** tab.
2. On the Download Center page, click the **Firmware** link on the left sidebar menu.
3. On the Firmware page, scroll down to the "MGP 464W" line, or click the letter **M** in the alphabet displayed across the top of the page.
4. Click the **Download** link located at the far right of the MGP 464 line.
5. On the next page, fill in the required information, then click the **Download_MGP464W_FW2xNN.exe** button. A File Download - Security Warning window is displayed.
5. Click **Save**. A Save As window opens.
6. Browse to the folder where you want to save the firmware installation file on your computer, and click **Save**.
7. When ready to install the new firmware on your computer, locate the downloaded file, and double-click on it to open it.
8. Follow the instructions on the Installation Wizard screens to install the new firmware on your computer. A Release Notes file, giving information on what has changed in the new firmware version, and a set of instructions for updating the firmware are also loaded to your computer.

### Updating the firmware on the MGP 464W

After you have installed the new firmware on your computer, you must upload it to the MGP 464W, as follows:

1. On the MGP 464W HTML page's **Configuration** tab, select **Firmware Upgrade** from the sidebar menu to display the Firmware Upgrade screen.
2. Click **Browse** to open the Choose file window, and locate the firmware file on your computer or server. The file extension must be **.S19**.




***Choose file window***

**CAUTION** *Uploading a file with an extension other than .S19 may cause the unit to stop functioning.*

3. Open the firmware file. Its name appears in the field below the Current Firmware Version on the Firmware Upgrade screen.

4. Click the **Upload** button on the Firmware Update screen to start the firmware update process. While the firmware is being uploaded, the **Upload** button changes to **Uploading…** .

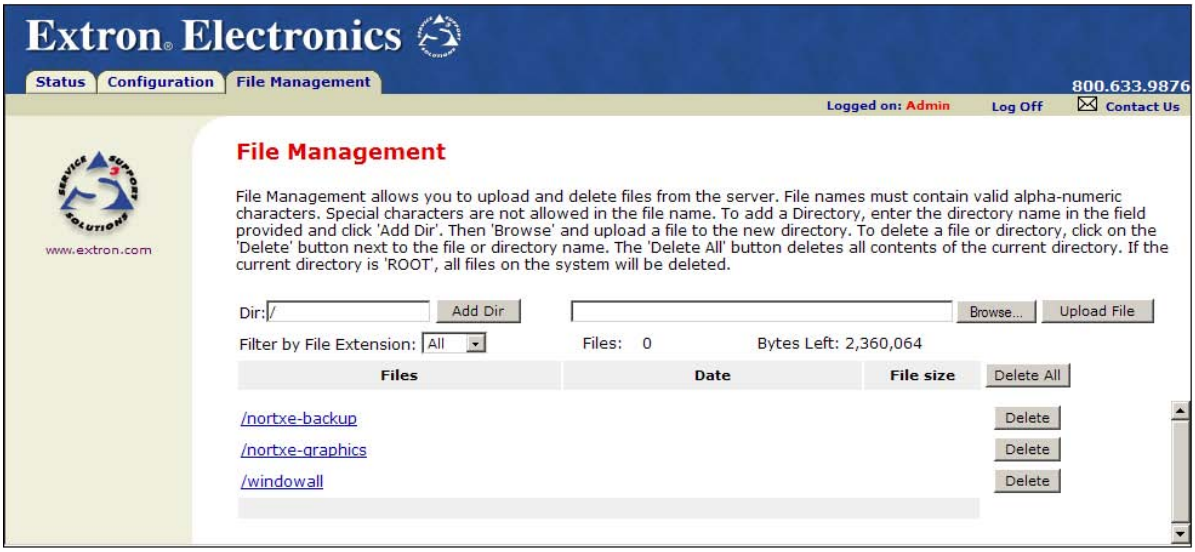
When the uploading process is complete, the **Uploading…** button on the screen changes back to **Upload**.

**NOTE** *As an alternative method of updating the MGP's firmware, you can use the Firmware Loader software. See appendix B, "Firmware Updates," for information on downloading and using this software.*

## Using the File Management Page

The File Management page lets you upload files to the WindoWall system from your computer or network, and to delete files from the unit. You can also upload personalized Web pages via this screen. To access the File Management page, select the File Management tab on the MGP 464W Web page.

You can use this function to load background images from your PC or the internet to display on the output screen. All background image files must be 24-bit bitmaps. The image files must be loaded to a folder named "nortxe-graphics."


Extron Electronics
Status
Configuration
File Management
800.633.9876
Logged on: Admin
Log Off
Contact Us
www.extron.com
File Management
File Management allows you to upload and delete files from the server. File names must contain valid alpha-numeric characters. Special characters are not allowed in the file name. To add a Directory, enter the directory name in the field provided and click 'Add Dir'. Then 'Browse' and upload a file to the new directory. To delete a file or directory, click on the 'Delete' button next to the file or directory name. The 'Delete All' button deletes all contents of the current directory. If the current directory is 'ROOT', all files on the system will be deleted.
Dir:/
Add Dir
Browse...
Upload File
Filter by File Extension: All
Files: 0
Bytes Left: 2,360,064
Files
Date
File size
Delete All
/nortxe-backup
/nortxe-graphics
/windowall
Delete
Delete
Delete

***File Management screen***

### Uploading files

Files to be uploaded to the MGP 464W must contain only valid alphanumeric characters and underscores. No spaces or special characters (symbols) are allowed.

To upload files from the server,

1. Click the **Browse** button to the right of the file name field.
2. Browse to locate the file that you want to upload, and open it. The file's name and directory path are displayed in the file name field on the File Management screen.
3. Click the **Upload File** button. The selected file name appears in the Files column on the File Management screen. (Files are listed separately under headings of their extensions.)

## Adding a directory

To add a directory or folder to the MGP 464W's file system,

1. Enter the directory name in the Dir: field, following the slash (/).
2. Click the **Add Dir** button.
3. With the directory name displayed, perform the "Uploading files" procedure described in the previous section to add a file to the directory. The directory name appears at the top of the Files column, preceded by a slash.

To add more files to the directory, click the directory name to open it, then use the "Uploading files" procedure. To exit the directory, click **(root)** or **(back)**.

## Other file management activities

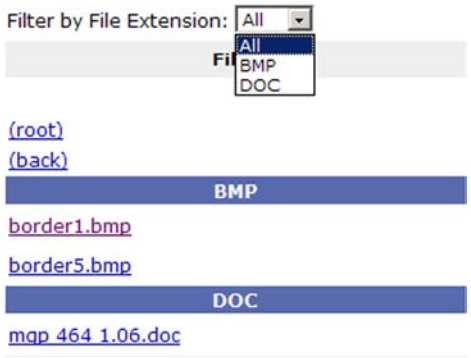
You can also perform the following tasks on the File Management screen:

**Open a file** — Click on the name of the file in the Files column.

**Delete a file** — Click the **Delete** button at the right end of the line that contains the file you want to remove.

**Delete all files** — Click **Delete All**.

**Display files by file extension** — The Filter by File Extension menu lists the extensions of the files that have been uploaded to the MGP. This menu lets you choose to display only files with the extension you select. Select **All** to display all uploaded files.




***Filter by File Extension menu***

# Chapter Five

## Special Application: Edge Blending

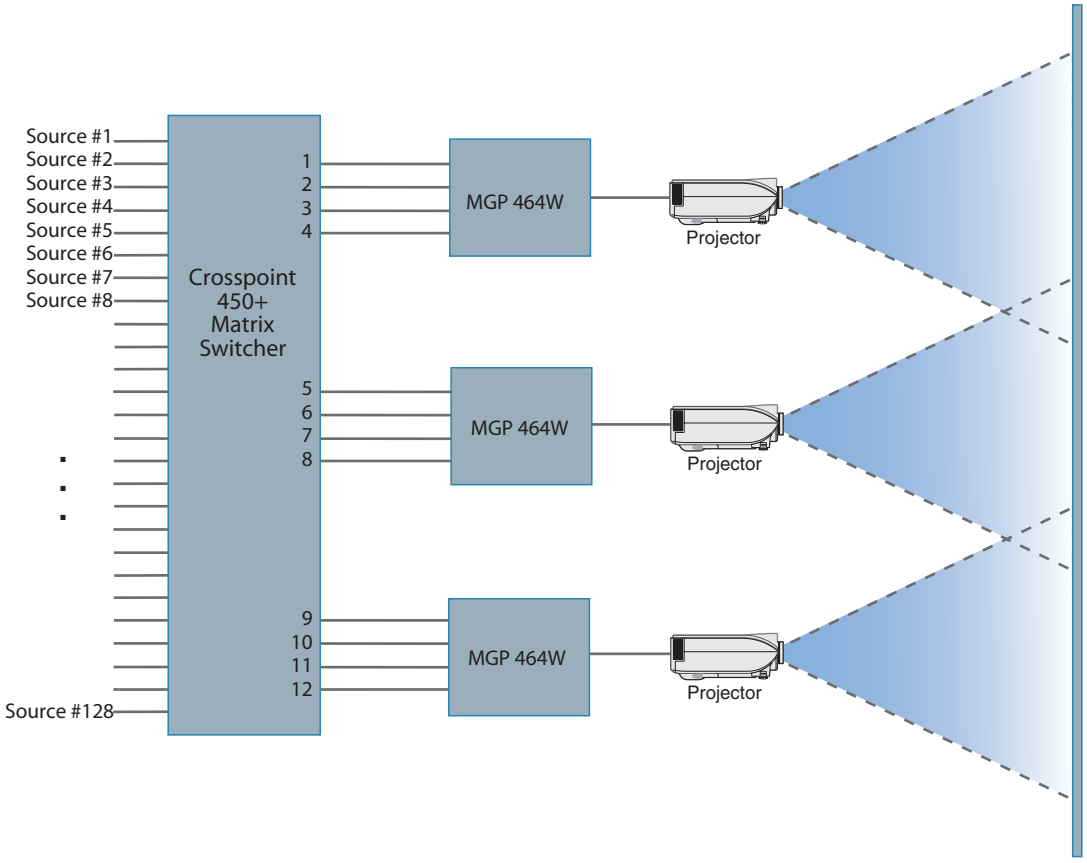
Example of a System Using Edge Blending

Example of an Edge-Matched System

Setting Up the WindoWall Console Software for Edge Blending

# Special Application: Edge Blending

In an edge-blended system, projectors with edge blending functionality are used to display multiple images on one screen to form a video wall display that appears to be one image. The figure below shows a diagram of a typical edge-blended system.




***Typical edge-blended system***

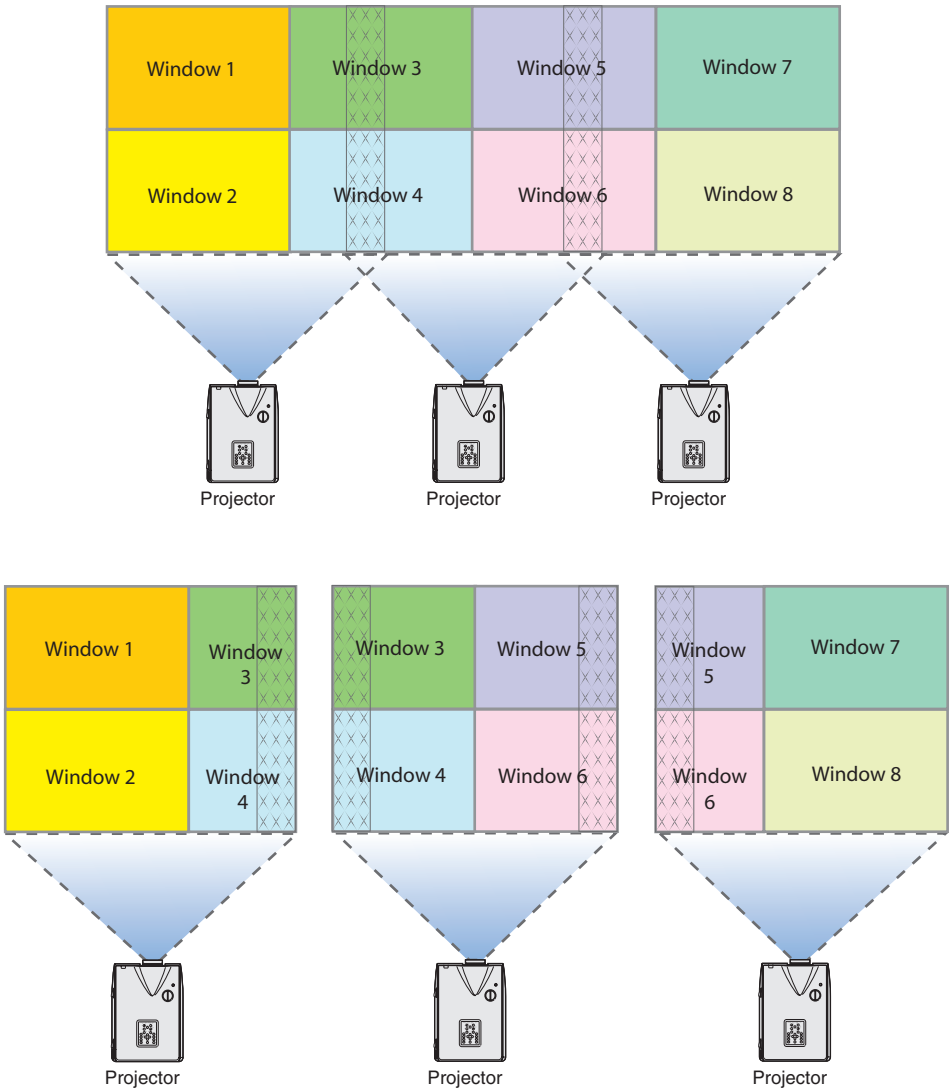
The edges of the projected images overlap by a few pixels; however, to the viewer, the video wall appears to contain one seamless image, with no indication of where the edges of the component images are.

**NOTE** *The MGP 464W **does not** manage the contrast adjustments and brightness compensation needed to visually blend the image edges so that the overlapped edges are not brighter than the rest of the image. With the WindoWall Console software, the MGP can manage the video information so that the information in the blended areas is the same on adjacent projectors.*

## Example of a System Using Edge Blending

The following illustrations show a system in which three projectors produce a display consisting of eight windows.

In the diagrams below, each cross-hatched area represents the blended area that two projectors are responsible for displaying. The top diagram shows the projector images overlapping. Because the images overlap, the video information in the overlap area is identical on both projectors.



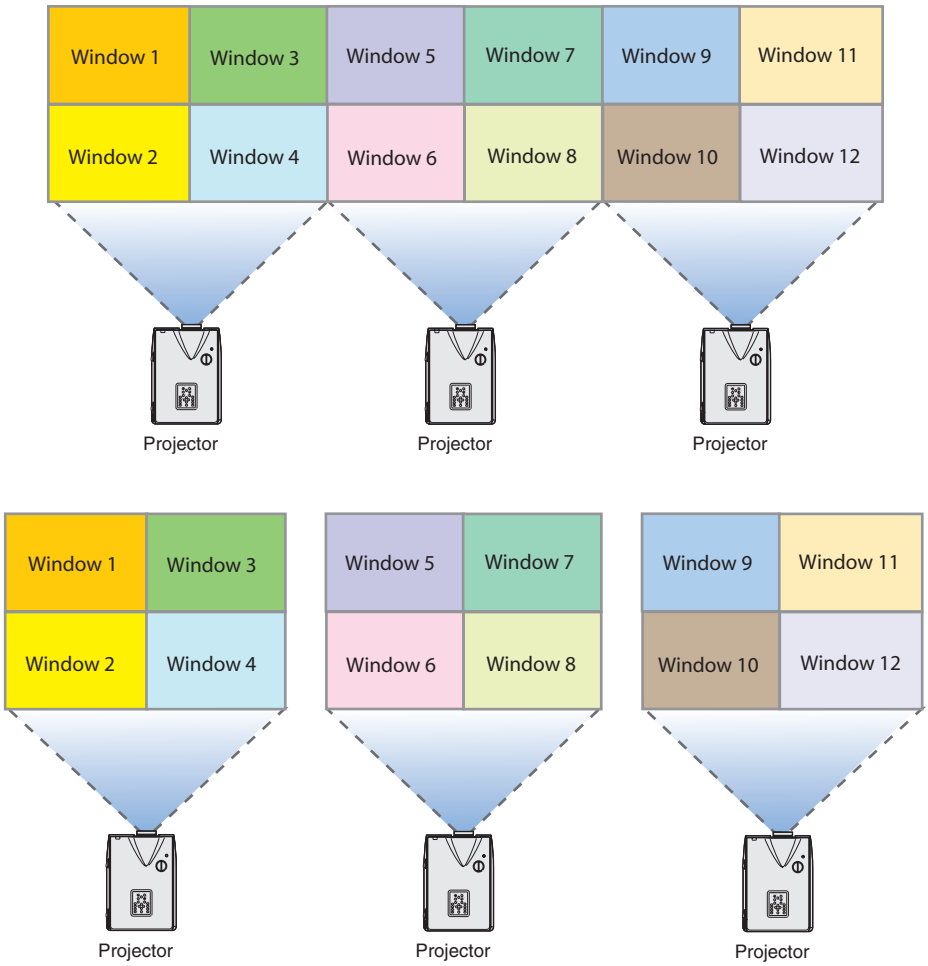

***Three projectors displaying overlapping images that require edge blending***

The bottom diagram shows the three projectors' images separated from each other. When you separate out what each side-by-side pair of projectors is displaying, you can see that a window in each MGP is needed to display any window that is in the overlapping area. In the example above, the images displayed in windows 3 and 4 from projector 1 and projector 2 must be the same. Since the total number of windows per MGP 464W is four, the maximum number of windows allowable in an edge-blended system varies based on the layout of the windows.

## Example of an Edge-matched System

By contrast, if you were to set up the system as "edge-matched" (no overlapping), the number of windows possible is always four per MGP. In an edge-matched system, in which there is no overlap, each MGP 464W can display all four windows, and a greater total number of windows can be tiled across the canvas.

In the example below, the top diagram shows the three projector images with edges matched. The bottom diagram shows the three images separated from each other.

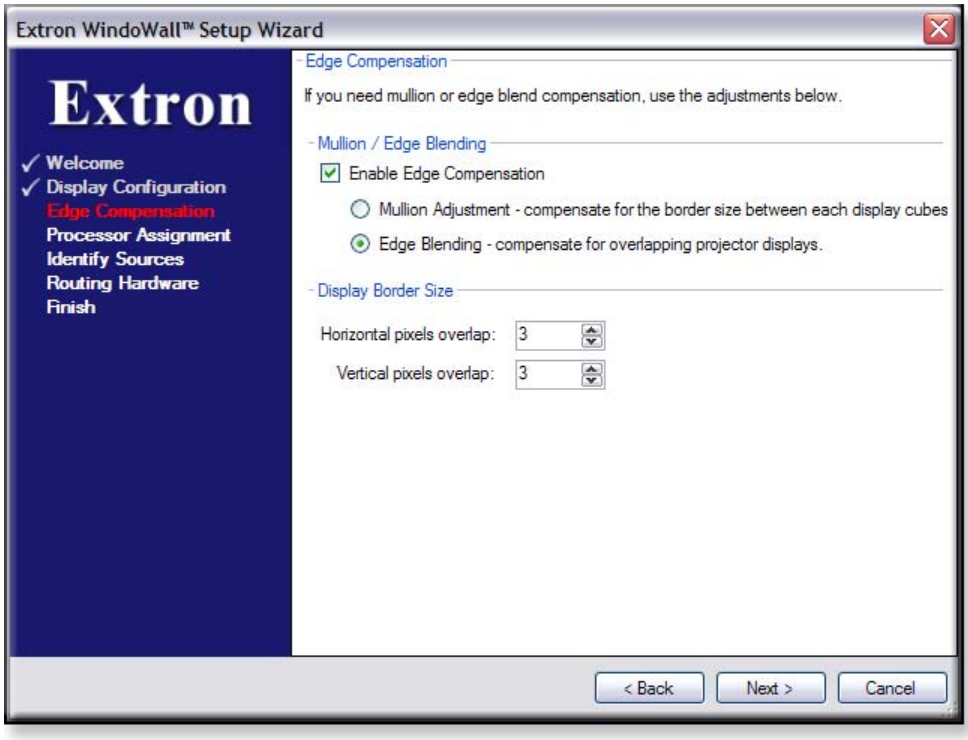



***Three projectors set up to produce an edge-matched display (no overlapping)***

## Setting up the WindoWall Console Software for Edge Blending

To set up the WindoWall software for a system in which edge blending will be used,

1. Install and open the WindoWall Console software. (See "Installing and starting the software" in chapter 3, "Software-based Configuration and Control."
2. From the Wizards menu on the main window, select **New Project**.
3. Follow the instructions on the Setup wizard screens until you reach the Edge Compensation screen. (See "Setting up a WindoWall project" in chapter 3, "Software-based Configuration and Control," for instructions on setting up a project using the wizard.)
4. On the Edge Compensation screen, select the **Enable Edge Compensation** check box and the **Edge Blending - compensate for overlapping projector displays** radio button. The screen changes as shown in the following figure.




***Edge Compensation wizard screen with Edge Blending selected***

5. In the two incremental spin boxes in the Display Border Size section, enter the number of overlapping pixels as follows:
   - **Horizontal pixels overlap** — Type or select the number of pixels by which the images' right and left borders will overlap each other.
   - **Vertical pixels overlap** — Type or select the number of pixels by which the images' top and bottom borders will overlap each other.
6. Click **Next** to continue, and complete the wizard, following the instructions on the screens.
7. Use the MGP test patterns to help you set up your projectors for the edge-blended video wall display.

## Special Application: Edge Blending, cont'd

# Appendix A

## Reference Material

Specifications

Part Numbers and Accessories

# Reference Material

## Specifications

**NOTE** *WindoWall is available in packages of two or three modules. The following specifications are given per unit, not per package.*

### Video input

| | |
|---|---|
| Number/signal type | 1-4 VGA-UXGA DVI, RGBHV, RGBS, RGsB, RsGsBs, RGBcvS, component video (interlaced or progressive), S-video, composite video<br>DVI digital video (MGP 464W DI only) |
| Connectors | |
| Inputs 1-4 | (4) x 5 female BNC<br>4 female DVI-I (MGP 464W DI only) |
| Inputs 5-19 (not used) | 15 female BNC |
| Nominal level | 1 Vp-p for Y of component video and S-video, and for composite video<br>0.7 Vp-p for RGB and for R-Y and B-Y of component video<br>0.3 Vp-p for C of S-video |
| Minimum/maximum levels | Analog: 0.0 V to 2.0 Vp-p with no offset |
| Impedance | 75 ohms |
| Horizontal frequency | 15 kHz to 100 kHz |
| Vertical frequency | 50 Hz to 120 Hz |
| Resolution range | 640x480 to 1920x1200*, 480p, 576p, 720p, 1080i, and 1080p<br>*Only the reduced blanking version of the 1920x1200 resolution is sampled at full bit rate. |
| DC offset (max. allowable) | 0.5 V |

### Video processing

| | |
|---|---|
| Digital sampling | 24 bit, 8 bits per color; 160 MHz standard |
| Colors | 16.78 million |

### Video output

| | |
|---|---|
| Number/signal type | 1 scaled RGBHV, RGBS, RGsB, HD YUV component video |
| Connectors | 5 female BNC, 1 female DVI-I |
| Nominal level | 1 Vp-p for Y of component video<br>0.7 Vp-p for RGB and for R-Y and B-Y of component video |
| Minimum/maximum levels | 0.0 V to 1.0 Vp-p |
| Impedance | 75 ohms |
| Vertical frequencies | 50 Hz, 60 Hz, 72 Hz, 96 Hz, 100 Hz, 120 Hz |
| Scaled resolution | 640x480[1,2,3,4,5,6], 800x600[1,2,3,4,5,6], 852x480[1,2,3,4,5], 1024x768[1,2,3,4], 1024x852[1,2,3,4], 1024x1024[1,2,3], 1280x768[1,2], 1280x1024[1,2], 1360x765[1,2], 1365x768[1,2], 1365x1024[1,2], 1366x768[1,2], 1400 x 1050[1,2], 1600 x 1200[1,2]<br>HDTV: 480p[2], 576p[1], 720p[1,2], 1080i[1,2], and 1080p[1,2]<br>[1] = at 50 Hz, [2] = at 60 Hz, [3] = at 72 Hz, [4] = at 96 Hz, [5] = at 100 Hz, [6] = at 120 Hz |
| Return loss | -30 dB @ 5 MHz |
| DC offset | ±25 mV with input at 0 offset |
| Switching type | Triple-Action |

### Sync

| | |
|---|---|
| Input type | RGBHV, RGBS, RGsB, RsGsBs, RGBcvS, YUV (tri-level or bi-level on Y channel) |
| Output type | RGBHV, RGBS, RGsB, YUV (tri-level or bi-level on Y channel) |
| Input standards | NTSC 3.58, NTSC 4.43, PAL, SECAM |
| Input level | 0.0 V to 5.0 Vp-p |

| | |
|---|---|
| Output level | 0.6 Vp-p for component video (tri-level sync)<br>TTL: 5.0 Vp-p, unterminated for RGBHV, RGBS |
| Input impedance | 510 ohms |
| Output impedance | 75 ohms |
| Polarity | Positive or negative (selectable) |

## Control/remote — processor/decoder/scaler

| | |
|---|---|
| Serial control port | RS-232 or RS-422, 9-pin female D connector |
| Baud rate and protocol | 9600 baud, 8 data bits, 1 stop bit, no parity (default) |
| Serial control pin configurations | RS-232: 2 = TX, 3 = RX, 5 = GND<br>RS-422: 2 = TX-, 3 = RX-, 5 = GND, 7 = RX+, 8 = TX+ |
| Ethernet control port | 1 RJ-45 male connector |
| Ethernet data rate | 10/100Base-T, half/full duplex with autodetect |
| Ethernet protocol | ARP, DHCP, ICMP (ping), TCP/IP, Telnet, HTTP, SMTP |
| Program control | Extron's WindoWall™ Console application software<br>Extron's Simple Instruction Set (SIS™)<br>Microsoft® Internet Explorer, Telnet |

## General

| | |
|---|---|
| Power | 100 VAC to 240 VAC, 50/60 Hz, 30 watts, internal |
| Temperature/humidity | Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing<br>Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing |
| Cooling | Fan, left to right (as viewed from front panel) |
| Rack mount | Yes, with included brackets |
| Enclosure type | Metal |
| Enclosure dimensions (per unit) | 3.4" H x 17.5" W x 12.0" D (2U high, 1 rack wide)<br>(8.6 cm H x 44.5 cm W x 30.5 cm D)<br>(Depth excludes connectors and knobs. Width excludes rack ears.) |
| Product weight | 8.5 lbs (3.9 kg) |
| Shipping weight | 18 lbs (9 kg) |
| Vibration | ISTA 1A in carton (International Safe Transit Association) |
| Regulatory compliance | |
| Safety | CE, C-tick, CUL, UL |
| EMI/EMC | CE, ICES, FCC Class A, C-tick, VCCI |
| Environmental | Complies with the appropriate requirements of WEEE. |
| MTBF | 30,000 hours |
| Warranty | 3 years parts and labor |

**NOTE** *All nominal levels are at ±10%.*

**NOTE** *Specifications are subject to change without notice.*

# Part Numbers and Accessories

## Included parts

These items are included in each order for a WindoWall package.

**NOTE** *The MGP 464W/464W DI WindoWall processors can be ordered only in sets of two or three units.*

| Included parts | Replacement part number |
|---|---|
| WindoWall 102 — 2 processors for 1x2 arrays | 42-115-02 |
| WindoWall 102 DI — 2 processors with DVI for 1x2 arrays | 42-115-12 |
| WindoWall 103 — 3 processors for 1x3 arrays | 42-115-03 |
| WindoWall 103 DI — 3 processors with DVI for 1x3 arrays | 42-115-13 |
| MBD 249 Rack Mounting Brackets kit | 70-155-01 |
| US style IEC power cord | |
| Rubber feet, self-adhesive | |
| *MGP 464W User's Manual* (on CD-ROM) | |
| WindoWall Console software (on CD-ROM) | |

## Optional accessories

These items can be ordered separately:

| Accessory | Part number |
|---|---|
| DVI-D male-to-male 6' patch cable | 26-584-06 |

# Appendix B

# Firmware Updates

Determining the Current Firmware Version

Downloading a Firmware File

Updating the Firmware on the MGP 464W

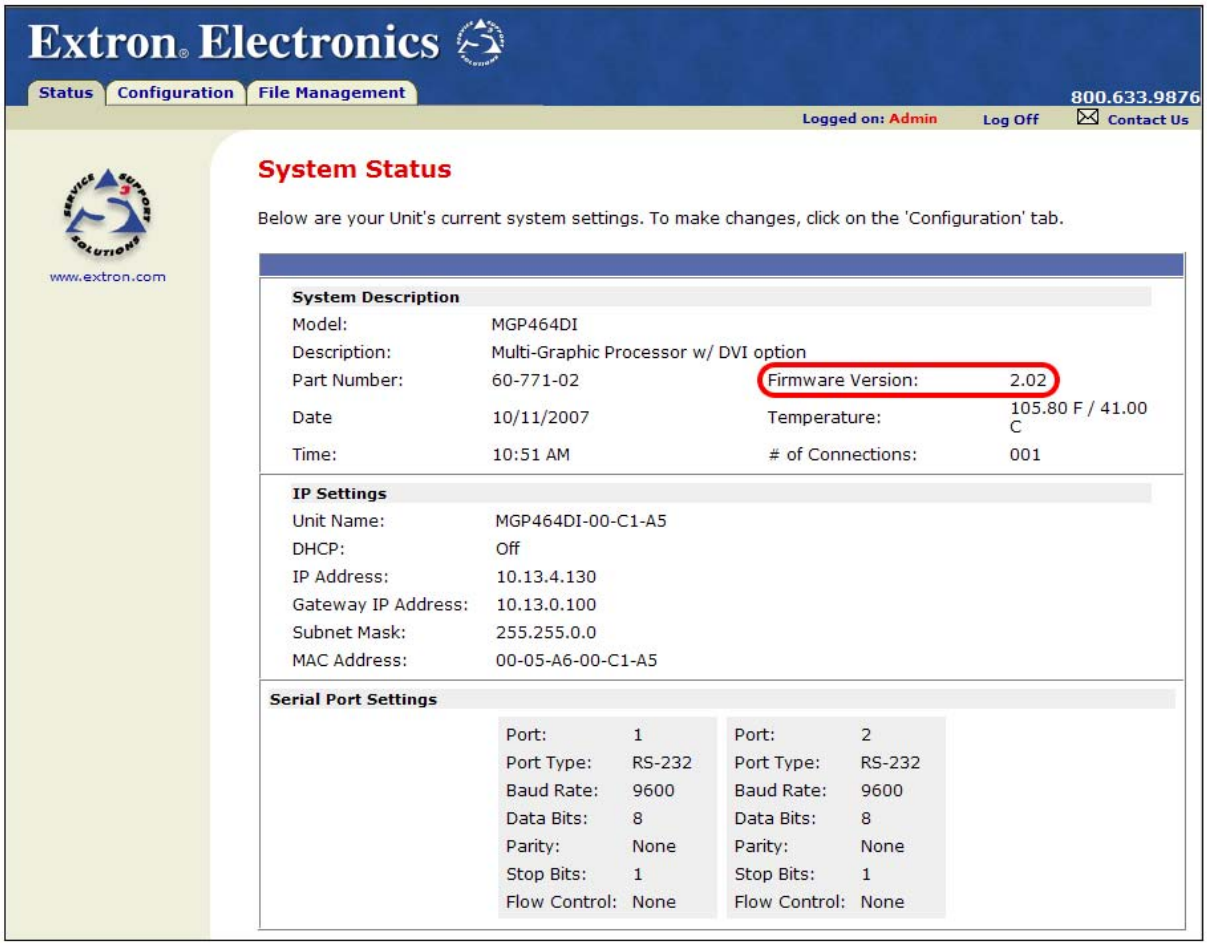
# Firmware Updates

Updates to the Extron MGP 464W WindoWall Processor firmware are made available periodically via the Extron Web site. If the need arises, you can replace the MGP 464W's main firmware via an IP connection without opening the unit or changing firmware chips.

## Determining the Current Firmware Version

There are two methods you can use to find out what firmware version is currently installed on your MGP 464W:

- **Using an SIS command:** Enter a query command (Q, Q0, Q1, Q2, Q3, or Q4). (See "Firmware version requests" in the "Command/response table for SIS commands" in chapter 3, "Software-based Configuration and Control," for information on entering SIS commands.)
- **Using the System Status Web page:** Select the **Status** tab on the MGP Web page to display the System Status screen. The firmware version is on the third line (to the right of the part number) in the System Description section.




***Firmware version number on System Status page***

## Downloading a Firmware File

To obtain the latest version of MGP 464W firmware,

1. Visit the Extron Web site (www.extron.com) and click the **Download** tab.
2. On the Download Center page, click the **Firmware** link on the left sidebar menu.
3. On the Firmware page, scroll down to the "MGP 464W" line; or click the letter **M** in the alphabet displayed across the top of the page to display products whose names start with M.
4. Click the **Download** link located at the far right of the MGP 464W line.

**NOTE** *The firmware file applies to both the standard and DI versions.*

5. On the next page, fill in the required information, then click the **Download_MGP464W_FWNxNN.exe** button (*N.NN* indicates the firmware version number). A File Download - Security Warning window is displayed.
5. Click **Save**. A Save As window opens.
6. Browse to the folder where you want to save the firmware installation file on your computer, and click **Save**.
7. When ready to install the new firmware, locate the downloaded file, and double-click on it to open it.
8. Follow the instructions on the Installation Wizard screens to install the new firmware on your computer. A Release Notes file, giving information on what has changed in the new firmware version, and a set of instructions for updating the firmware are also loaded.

## Updating the Firmware on the MGP 464W

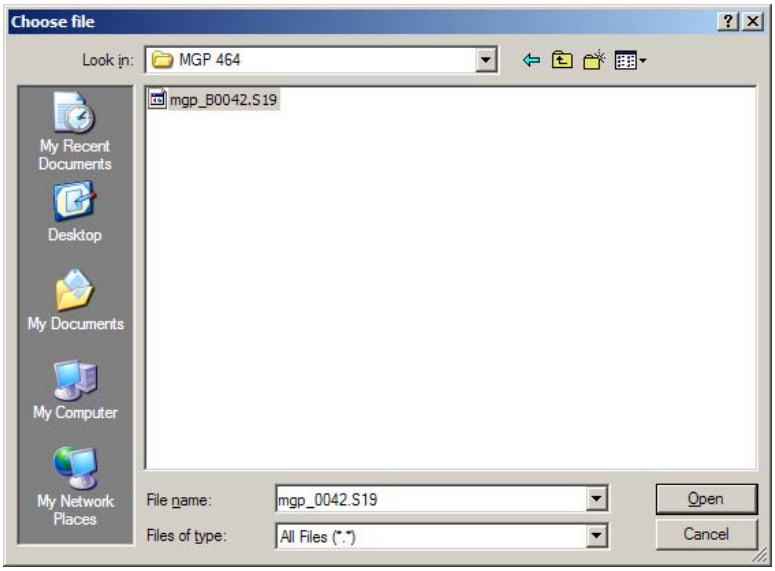
After you have installed the new firmware on your computer, you can upload it to the MGP 464W.

### Updating using the Firmware Upgrade Web page

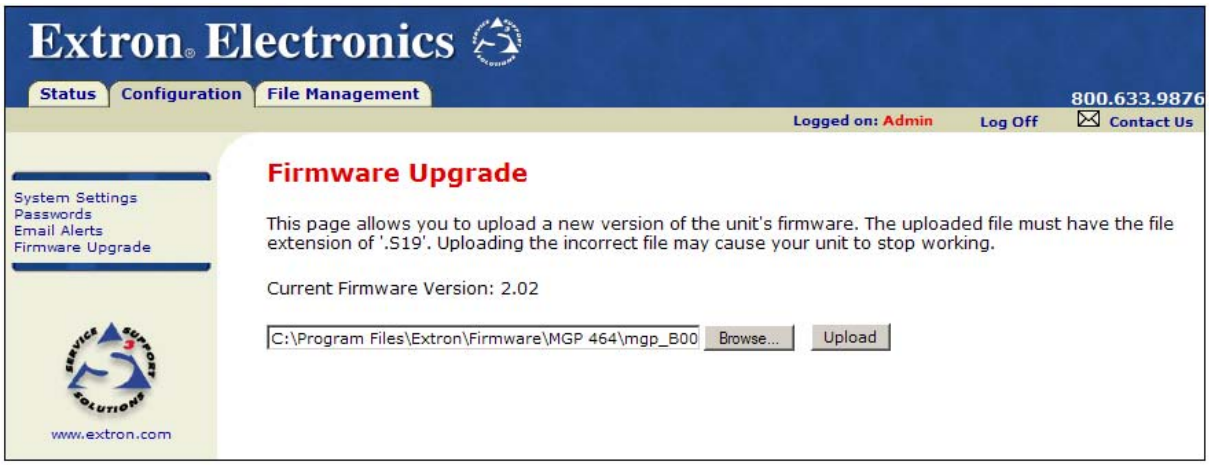
To update the firmware using the Web pages,

1. On the MGP 464W's **Configuration** tab, select **Firmware Upgrade** from the sidebar menu to display the Firmware Upgrade screen.
2. Click **Browse** to open the Choose file window, and locate the firmware file on your computer or server. The file extension must be **.S19**.

**CAUTION** *Uploading a file with an extension other than .S19 may cause the unit to stop functioning.*




3. Open the firmware file. Its name and the path to it appear in the field below the Current Firmware Version on the Firmware Upgrade screen.




***Firmware Upgrade screen***

4. Click the **Upload** button on the Firmware Upgrade screen to start the firmware update process. While the firmware is being uploaded, the **Upload** button changes to **Uploading...** .

   When the uploading process is complete, the **Uploading...** button changes back to **Upload**.

## Updating using the Firmware Loader

An alternative way to update the MGP's firmware is to download and run the Firmware Loader software.

1. Download the Firmware Loader installer executable file to your computer.
   a. On the Extron Web page, click the **Download** tab.
   b. On the Download Center page, click **Software** on the left sidebar menu.

c. Locate the "Firmware Loader" line and click the **Download** link at the far right.

d. Follow the instructions on the download screens to save the installer file to your computer.

2. Locate the Firmware Loader executable file in your computer's file system and open it.

3. Follow the instructions on the Installation Wizard screens to install the Firmware Loader on your computer. The installer program places the Firmware Loader file, "FWLoader.exe" at the following location:

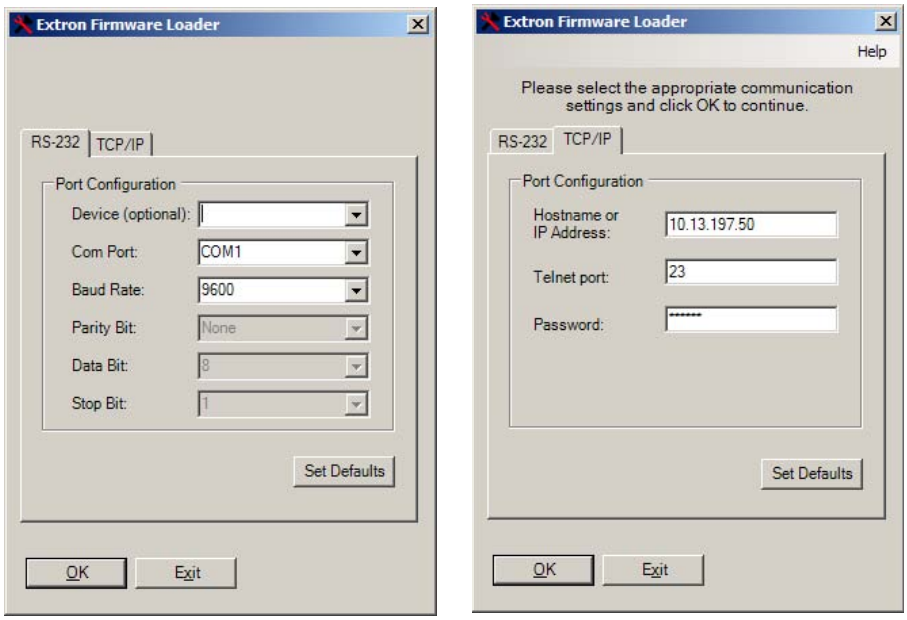
   c:program Files\Extron\FWLoader

   (If the Extron and FWLoader folders do not yet exist in your Program Files folder, the installer creates them.)

4. Access the FWLoader.exe file via your desktop Start menu by making the following selections:

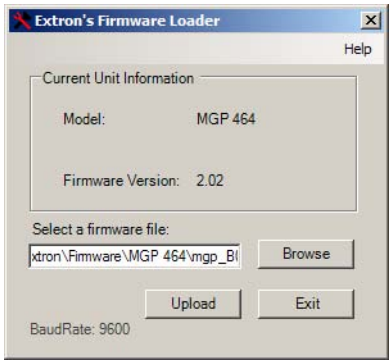
   **Start > All Programs > Extron Electronics > Firmware Loader > Firmware Loader**

5. On the first screen that appears, select the tab for the desired connection type and enter the parameters for your MGP, and click **OK**.




- **RS-232 tab** — From the drop-down menus, select the appropriate COM port number (obtained from your system administrator) and baud rate (the default is 9600).
- **TCP/IP tab** — Enter your MGP's IP address, Telnet port (the default is 23), and, if required, password.

6. In the **Select a firmware file** field on the next screen, enter the path to the new MGP firmware file on your computer, or click **Browse** to locate and open it. (By default, the firmware file is placed at c:\Extron\Firmware\MGP464W when downloaded from the Extron Web site.)




7. Click **Upload**. Messages appear on the firmware file selection window indicating when the unit is uploading the firmware, then resetting itself.

   When the firmware upload process is completed, the message "Transfer Complete!" is displayed, and the new firmware version number appears in the Current Unit Information field.

8. Click **Exit** to close the Firmware Loader.

# Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

**USA, Canada, South America, and Central America:**

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

**Europe, Africa, and the Middle East:**

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

**Asia:**

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

**Japan:**

Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

***If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.***

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

www.extron.com

Extron Electronics, USA
1230 South Lewis Street
Anaheim, CA 92805
800.633.9876 714.491.1500
FAX 714.491.1517

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort, The Netherlands
+800.3987.6673 +31.33.453.4040
FAX +31.33.453.4050

Extron Electronics, Asia
135 Joo Seng Rd. #04-01
PM Industrial Bldg., Singapore 368363
+800.7339.8766 +65.6383.4400
FAX +65.6383.4664

Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan
+81.3.3511.7655 FAX +81.3.3511.765

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